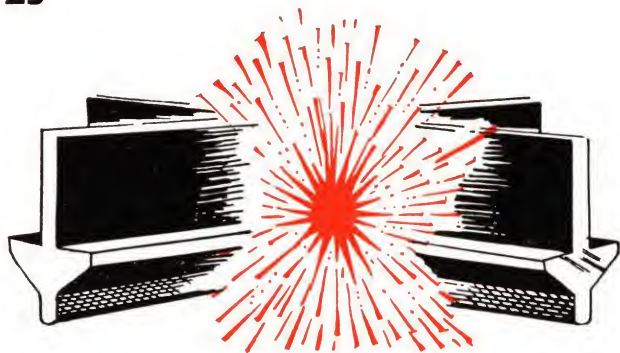




WINDOWS

by

VENTO



VENTO WELDED STEEL WINDOWS

THE COMPANY

For fifteen years THE VENTO STEEL PRODUCTS COMPANY have been manufacturing Electric Arc Welded steel windows, having pioneered numerous developments within the industry. Modern plant and equipment, a thoroughly experienced Engineering Department; and a production staff of window craftsmen, are devoted to the manufacture of steel window products of genuine merit.

THE ORGANIZATION

In addition to an experienced corps of thoroughly trained field representatives, distribution facilities are maintained in principal cities; and the Company's erection organization will undertake complete installation contracts when required. A competent Engineering staff is at the service of Vento clients.

THE PRODUCT

Domestic steel—Full weight and depth of sections—thorough electric arc welding—means unusual strength, rigidity and lasting window satisfaction.

Vento window products include types for all purposes of industrial, residential or public construction and embrace the entire range of casement and industrial window groups. Individual catalogs are available on each.

"WINDOWS BY VENTO"

is definite assurance of the very highest quality of steel window construction and unit responsibility throughout.

I N D E X

	Page
Architectural Windows	14-16
Areaway Windows	28
Basement Windows	29
Casements—Intermediate Section	
Casement Combination }	10-13
Casement Intermediate }	
Casement Projected }	
Casements—Residential	3-9
Commercial Windows	17-25
Continuous Windows	31
Doors—French	7
Doors—Industrial	25
Hardware	3, 7, 19, 21
Industrial Windows	17-25
Insulpanes (Casement Storm Sash) ..	6
Intermediate Casements	10-13
Mechanical Operators	30
Pivoted Windows }	14-25
Projected Windows }	
Protection Windows	26, 27
Rack and Pinion Operators	30
Screen Doors	7
Security Windows	28
Surrounds	6
Utility Windows	28

VENTO STEEL PRODUCTS COMPANY

MUSKEGON MICHIGAN

WAREHOUSE STOCKS

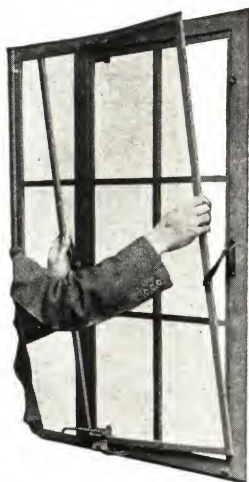
Muskegon • Chicago • New York • Atlanta •
Miami • Harrisburg • Cleveland • Minneapolis •
Denver • Lincoln • Oklahoma City • Dallas •
• Philadelphia •

Distributors and Representatives in All Principal Cities • Dealers Everywhere

VENTO RESIDENCE CASEMENTS

DELUXE SIMPLEX AND ECONOMY

All types are with outswinging ventilators and designed for outside putty glazing. All are equipped with extended cleaning hinges. Dimensions, construction details, and workmanship are identical. The principal difference is in the method of operation, and the screening details.



De Luxe Casement with
Quadrant Adjuster

"DE LUXE" CASEMENTS

Standard sizes are shown on pages 4 and 5

are designed particularly for the screened requirements of residence installations. This is truly the modern casement window and is recommended for all construction where screening is required.

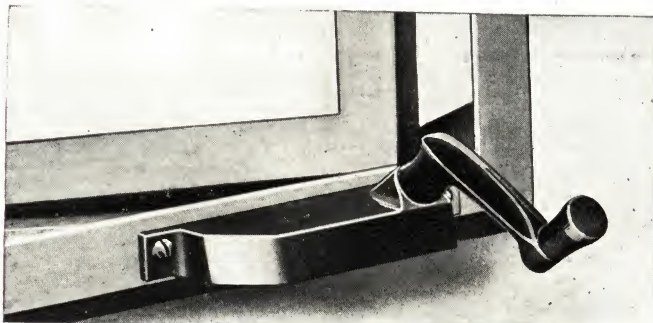
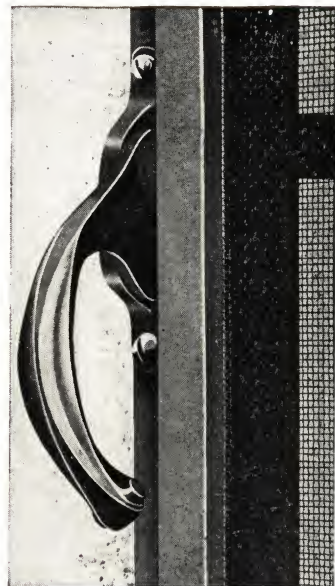
This type of casement is equipped with underscreen hardware which operates the window through the sill of the casement frame, permitting the entire ventilator opening to be screened with flat screens attached to the inside of the casement.

The screen is not removed for any stage of window operation.

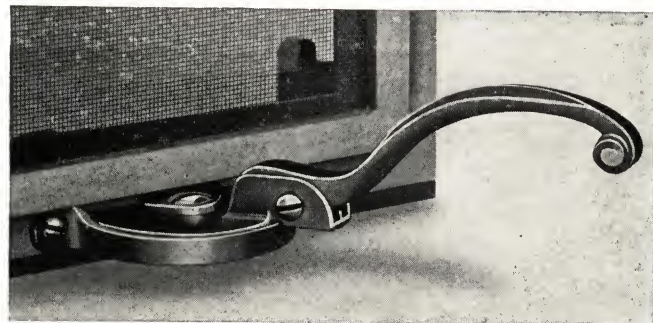
Screens are attached and removed without tools, being held firmly by strong brackets.

Standard hardware is attractively bronze finished. Full polished solid bronze is available.

Improved Locking Handle No. 350. Standard for De Luxe Casements. Semi-finished medium statuary solid bronze



Improved Rotary Type Underscreen Operator No. 315. Supplied in medium statuary finish. Either this type as above or quadrant No. 310 optionally supplied for De Luxe Casements in solid bronze at extra price



Improved Direct Action Quadrant Operator No. 310. Entire operator including lever arm is of solid bronze in full finished medium statuary. Optionally supplied for De Luxe Casements at an extra. Note: This new quadrant handle will permit venetian blinds to come below the sight line of the bottom casement rail

SIMPLEX CASEMENTS—STANDARD SIZES ON PAGES 4 AND 5

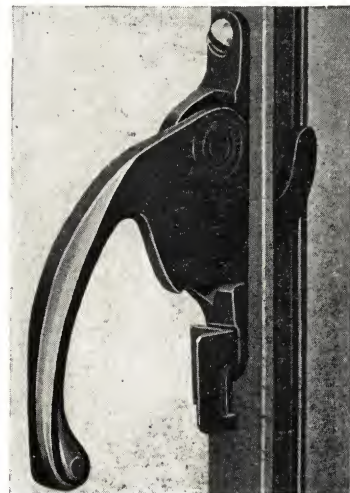
The general construction is the same as the De Luxe Casement, differing only in Hardware and Screening Details.



The locking handle operates through the casement frame permitting a flat type of screen to be used. This type of window, however, is not equipped with sill adjusters or opening devices and the ventilator leaf must be opened and closed by hand, for which purpose the pull ring is attached. The vent is held in any open position by adjustable friction built into the hinges. Operation of this type of window is illustrated at the left.

Being without sill adjusters, the screen must be of a type permitting same to be opened to operate the window. Side hinged screens as illustrated are recommended. Roll-Screens can also be used.

The screen snaps into place through a spring bolt operating in the keeper attached to the locking handle.



Locking Handle No. 375 for Simplex and Economy Casements. Solid bronze semi-finished in medium statuary.

Note: This handle will also be supplied for De Luxe Casements when venetian blinds are to be used.

Handle No. 375S, similar for sill vent units

ECONOMY CASEMENTS • *Standard Sizes on Page 6*















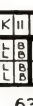







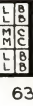





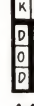


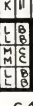



























A residence type casement in which the intermediate vertical bars are omitted, giving the popular horizontal line effect. The marked savings in glazing costs plus the low cost of this group of windows makes this casement suitable where economy and first cost are of prime consideration.

Hinges, hardware, screening details and method of operation are exactly the same as Simplex Casements.

NOTE: Standard Rollscreens are available for all casement types where required.










VENTO RESIDENCE CASEMENTS

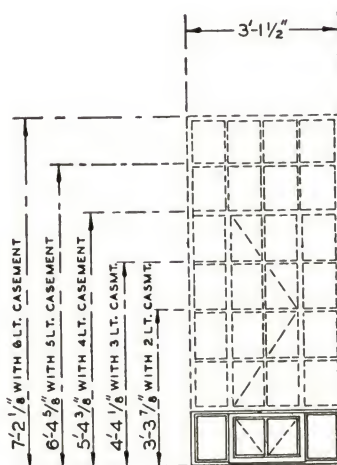
STANDARD TYPES AND SIZES

 1212	 2214	 4214 VC	 4224	 6214 VC	 6224 VC	 6224	 8224 VC	 2222
 1312	 2314	 4314 VC	 4324	 6314 VC	 6324 VC	 6324	 8324 VC	
 1313	 2316	 4316 VC	 4326	 6316 VC	 6326 VC	 6326	 8326 VC	 2323
 1413	 2416	 4416 VC	 4426	 6416 VC	 6426 VC	 6426	 8426 VC	
 1414	 2418	 4418 VC	 4428	 6418 VC	 6428 VC	 6428	 8428 VC	 2424
 1514	 2518	 4518 VC	 4528	 6518 VC	 6528 VC	 6528	 8528 VC	
 1614	 2618	 4618 VC	 4628	 6618 VC	 6628 VC	 6628	 8628 VC	






TRANSOM TYPE COMBINATIONS

Main vents side hinged. Transoms swing out.

 2416T2	 4416 VC T2	 4426 T4
 2518T2	 4518 VC T2	 4528 T4
 2618 T4	 4618 VC T4	 4628 T8



SILL TYPE VENTILATORS

 21-S2	 41-S2	 41-S4
 61-S4	 81-S4	

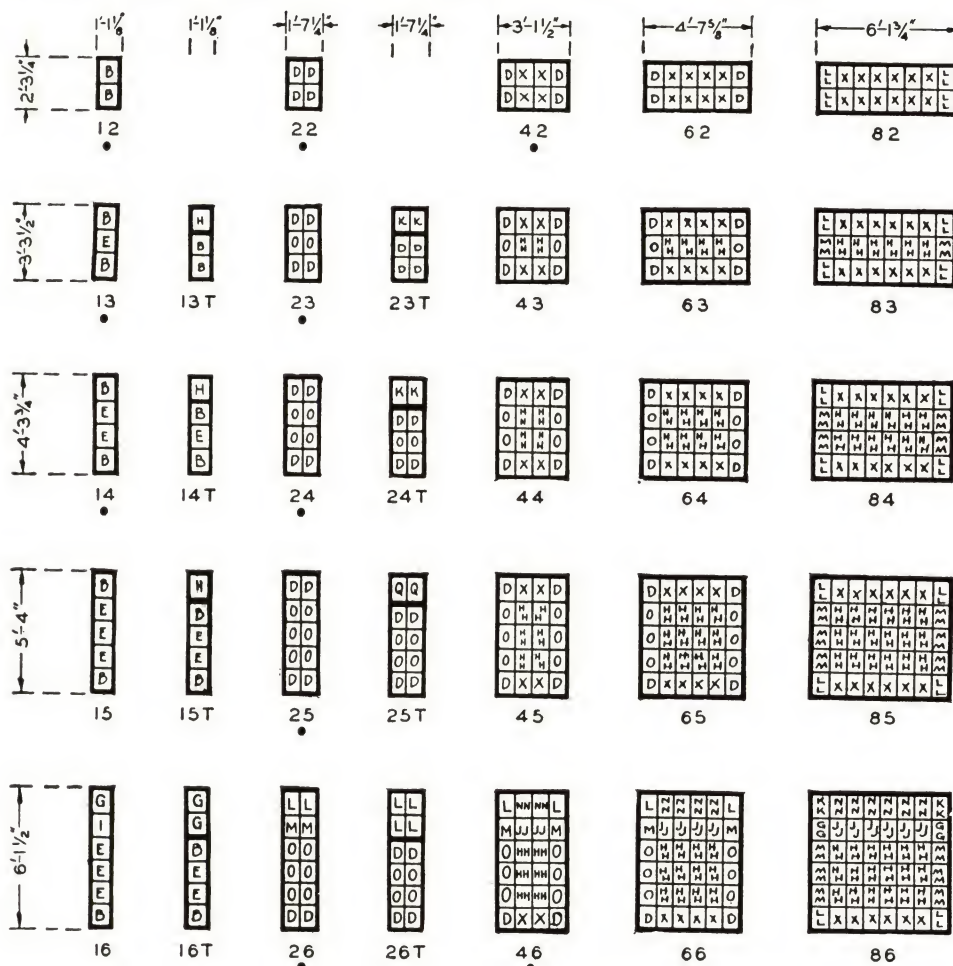
Hinged at Bottom to Open Inward

See diagram at left for standard still vent units combined with other units of varying lights high.

ADD 1/8" ALL around for opening dimensions.

VENTO RESIDENCE CASEMENTS

STANDARD TYPES AND SIZES



GLASS SIZES

Pane	Sizes
A	8 x 12
B	11 7/8 x 12 3/8
C	10 7/8 x 12
D	8 3/8 x 12 3/8
E	11 1/8 x 12
F	7 1/8 x 10 1/4
G	11 1/8 x 10 3/8
H	11 1/8 x 11 7/8
I	11 1/8 x 11 1/4
J	10 1/8 x 12
K	8 3/8 x 11 7/8
L	8 3/8 x 10 3/8
M	8 3/8 x 11 1/4
N	8 x 9 1/8
O	8 3/8 x 12
P	8 x 9 7/8
Q	8 3/8 x 11 7/8
R	8 3/8 x 11 1/8
S	8 x 10 3/8
T	8 3/8 x 11 1/8
U	8 3/8 x 11 1/8
V	8 3/8 x 11 1/8
W	11 1/8 x 11 1/8
X	8 1/8 x 12 3/8
Y	8 3/8 x 11 3/4
Z	8 1/8 x 10 3/8
AA	8 3/8 x 10 3/8
BB	8 3/4 x 12 3/8
CC	8 3/4 x 12
DD	8 1/8 x 10 1/4
EE	8 1/8 x 9 1/8
FF	8 1/8 x 9 3/8
GG	8 1/8 x 11 1/4
HH	8 1/8 x 12
II	8 1/8 x 11 7/8
JJ	8 1/8 x 11 1/4
KK	8 1/8 x 10 3/8
LL	8 1/8 x 12 3/8
MM	8 1/8 x 12
NN	8 1/8 x 10 3/8
OO	8 1/8 x 11 7/8
PP	8 1/8 x 11 7/8
QQ	8 1/8 x 10 1/4
RR	8 1/2 x 11 7/8

Templates required for circular head types.
Lights not lettered are size "A."

NOTES

Sizes given are exact sash sizes. 1/8" must be allowed on all sides for sash clearance. If more than one type is used in the same opening add 1/4" to the sum of the sash sizes for each mullion or transom used to determine the overall sash size. For example: Type 4426 is 3'-1 1/2" wide. Two types 4426 side by side in the same opening would be 6'-3 1/4".

Handing of casements is determined by location of hinges. Viewed from outside, right-hand casements being hinged at right; left-hand being hinged at left.

VC—Ventilator in center

S—Bottom hinged sill type

●—Stock type

T—Transom Bar Type

Side hinged vents are outward opening. All types furnished with partial or complete omission of muntins when required.

Casements with single side hinged ventilators may be right or left hand as desired; i.e.: type 2416R or 2416L.

1st Figure—Number of lights wide

2nd Figure—Number of lights high

3rd Figure—Number of vents

4th Figure—Lights each vent

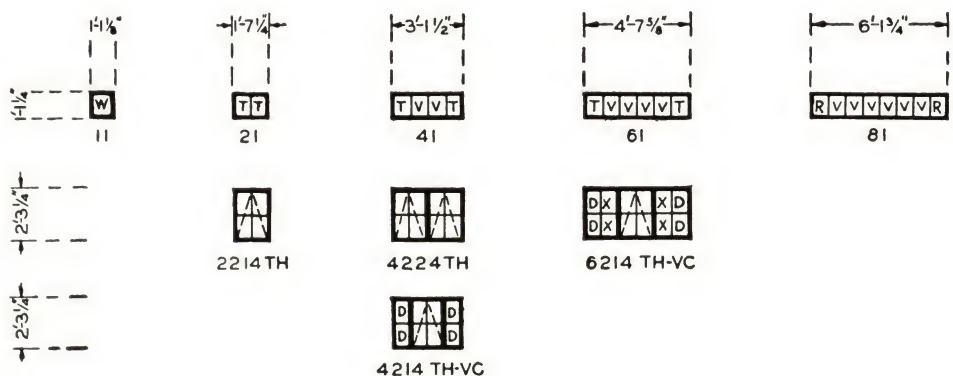
For Dimensions and Details of Sill Vents combined with other Units—see Page Four.

The diagonal dotted lines in the drawings represent the Ventilated portion of Each Window.

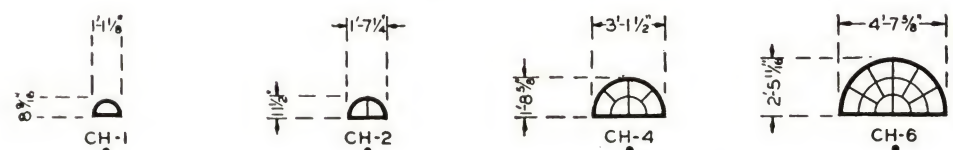
Those shown without these lines are "Fixed," i.e.: without Ventilators.

The point at which these lines meet is the side on which the Ventilators are hinged.

TRANSOM TYPE WINDOWS



CURVED HEAD TRANSOMS

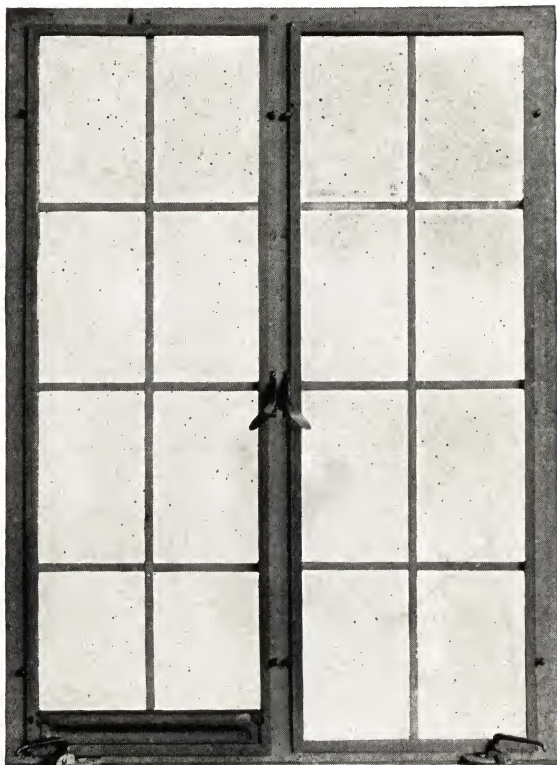


VENTO ECONOMY CASEMENTS STANDARD TYPES AND SIZES

"Simplex" Type with Intermediate Vertical Muntins Omitted
For Construction Requiring Maximum Window Economy • Hardware and All Details
Are the Same as "Simplex" Casements

					GLASS SIZES Pane Size 1 = 16 ⁷ / ₁₆ " x 12" 2 = 17 ³ / ₄ " x 12 ⁵ / ₈ " 3 = 17 ⁷ / ₁₆ " x 12 ⁵ / ₈ " 4 = 17 ⁷ / ₁₆ " x 11 ³ / ₄ " 5 = 17 ³ / ₄ " x 11 ³ / ₄ " 6 = 17 ¹⁵ / ₁₆ " x 11 ³ / ₄ " 7 = 17 ³ / ₄ " x 12" 8 = 17 ³ / ₁₆ " x 12" Lights not numbered are size 1
HM 2214	HM 4214 JH	HM 4224	HM 6224 JH	HM 6214 VC	
HM 2314	HM 4314 JH	HM 4324	HM 6324 JH	HM 6314 VC	
HM 2416	HM 4416 JH	HM 4426	HM 6426 JH	HM 6416 VC	
HM 2518	HM 4518 JH	HM 4528	HM 6528 JH	HM 6518 VC	

VENTO INSULPANES



A refinement of the storm sash principle providing in effect double glazing. It adds to comfort, saves fuel and prevents objectionable condensation. Shipped completely glazed and are interchangeable with screens. Supplied in fixed units, with small tilt-in vent as illustrated above, or with ventilators one light high, permitting winter ventilation.

REDWOOD SURROUNDS

Vento Redwood surrounds have unusual resistance to weather and provide a brick guide for the mason which enables the brick to be laid up accurately and quickly.

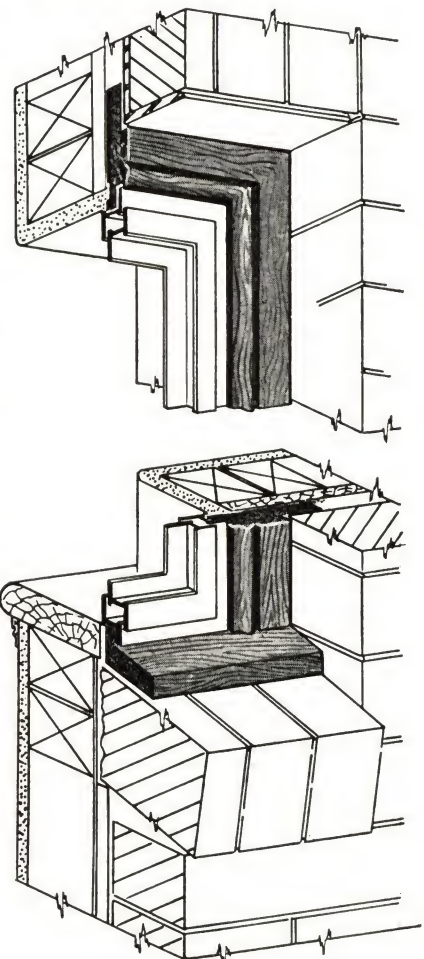
The use of Redwood surrounds provides a wider line between the brick and the casement, which is sometimes desirable to achieve the effect of added weight or width.

Redwood Surrounds not only provide a natural framing, enhancing the beauty of the casement installation itself, but also eliminates the use of other framing and trim. Surrounds are shipped mitered and cut to exact length ready for attachment. *No fitting necessary—no miters to cut—exact fit guaranteed.*

The groove in the surround that seats the casement section insures an absolutely weather-tight job.

Mastic is supplied for bedding and pointing the sash section.

Redwood mullions for multiple openings are also available and which are mitered to fit standard single head surround sections.

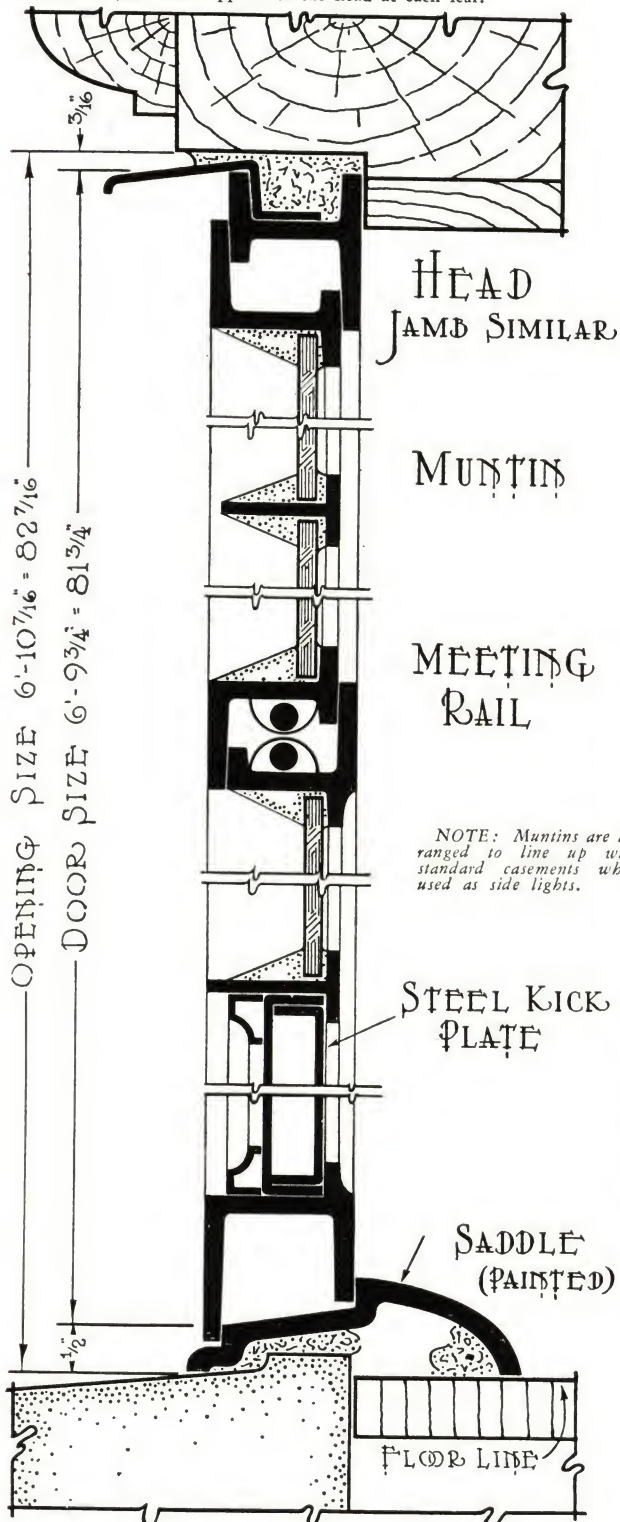


VENTO STANDARD STEEL FRENCH DOORS

CONSTRUCTION DETAILS

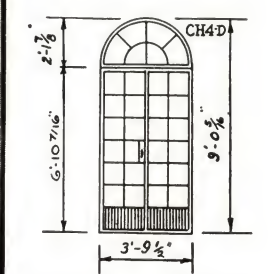
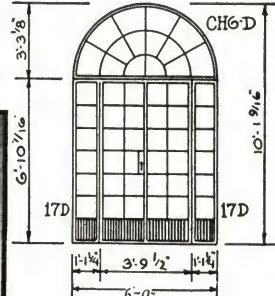
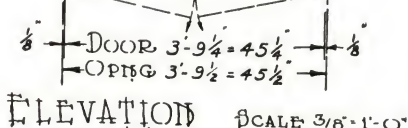
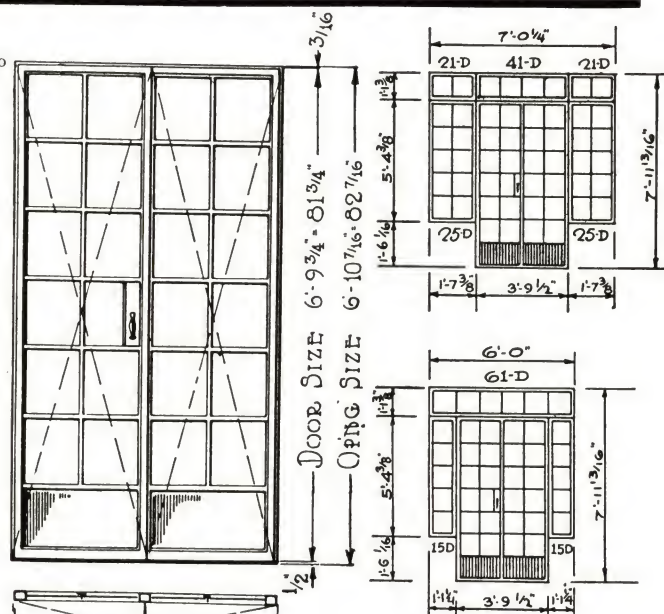
Hardware

Each leaf is hung on three 3-inch bronze butts.
Right hand leaf is fitted with aluminum lock box and bronze lever handles to operate concealed rods that lock doors at head and sill.
Doors also lock at the center.
Left hand leaf is fitted with concealed top and bottom bolts.
Friction adjusters are applied to the head at each leaf.



SECTION THRU DOOR

Scale 1/2 Full Size



All Dimensions Shown Are Opening Sizes

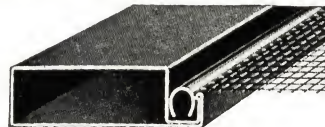
French Screen Doors

Furnished complete with mortise lever latch, steel hinges, top and bottom bolts and air closer.

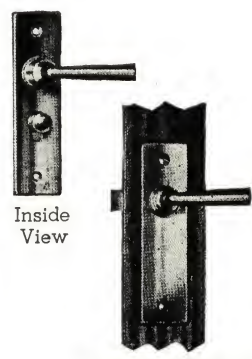
Two panel doors have a 3-inch top rail, 2-inch stiles and cross rail and 5 3/4-inch bottom rail. Thickness of stile 3/8 inch.

Single panel doors have a 3-inch top rail, 2-inch stiles and 12-inch bottom rail.

Screening is readily replaced by removing tube, applying new screen cloth and forcing tube in its groove.



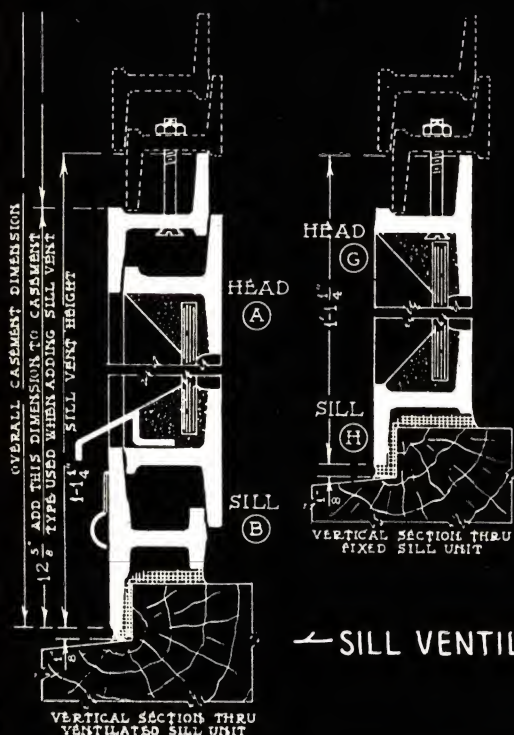
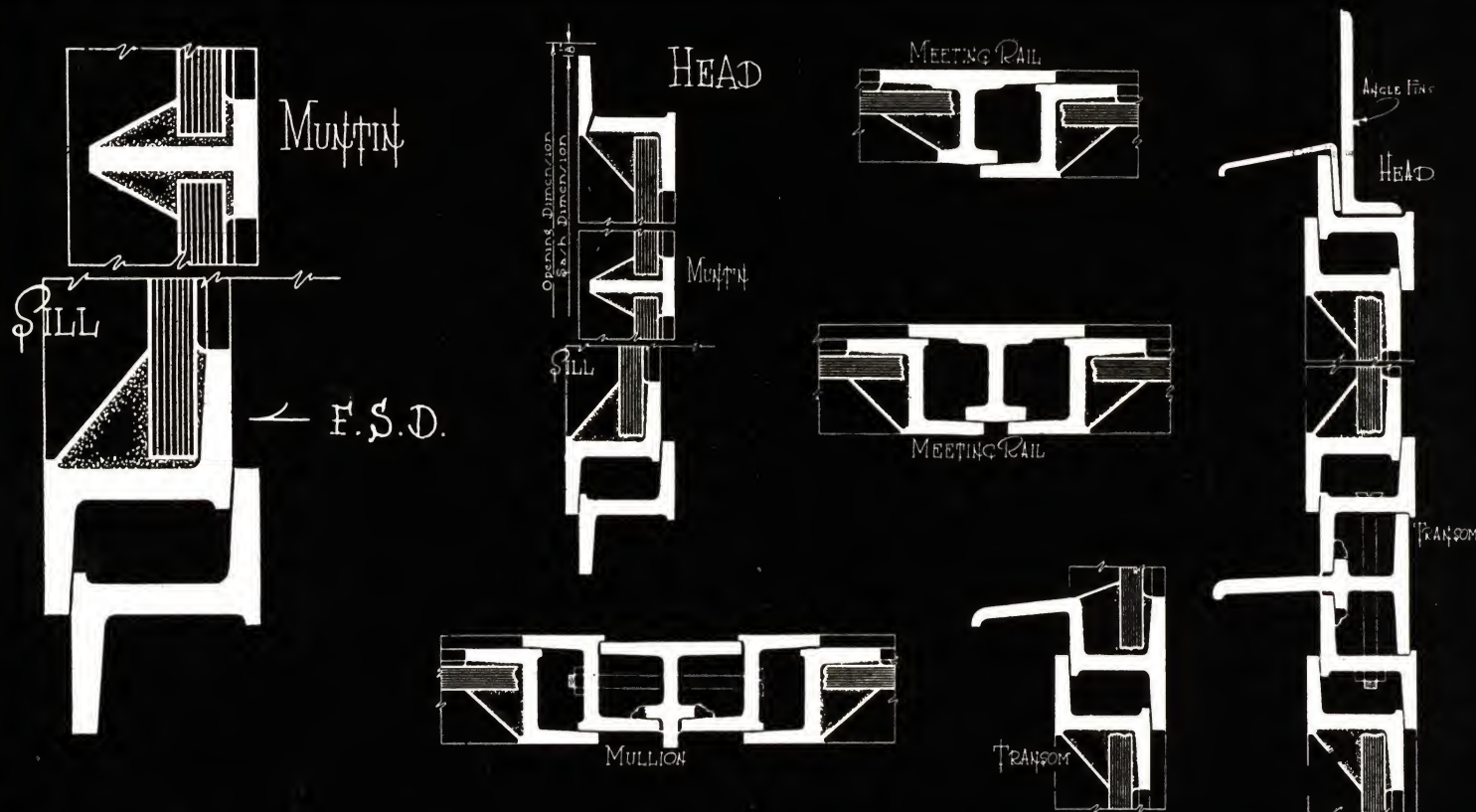
Section of Screen Door



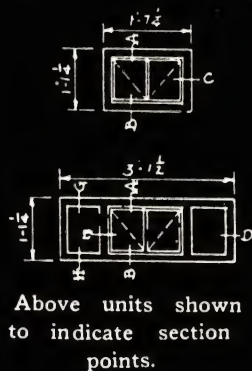
Outside View of Mortise Lever Latch

VENTO RESIDENCE CASEMENT ASSEMBLY DETAILS APPLYING TO ALL CASEMENT TYPES

See Page 4 for Combination Heights Using Sill Ventilators



SILL VENTILATOR UNITS



Above units shown to indicate section points.

BAYS AND PIPE MULLION DETAILS

- TYPICAL BAYS
- OVERALL WIDTH
- SPRAYED BAY - 30° ANGLE
- OVERALL WIDTH
- SPRAYED BAY - 45° ANGLE
- OVERALL WIDTH
- SPRAYED BAY - 60° ANGLE
- OVERALL WIDTH
- SQUARE BAY - 90° ANGLE
- OVERALL WIDTH
- SQUARE SPAYED BAY

OVERALL WIDTH	OVERALL WIDTH	OVERALL WIDTH	OVERALL WIDTH
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

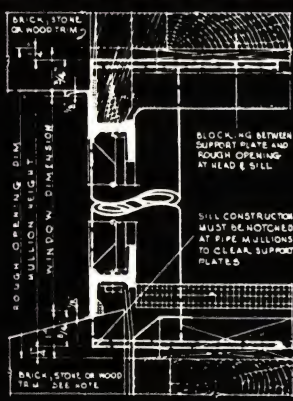
ABOVE TABLE IS BASED ON ONE SINGLE UNIT IN FRONT AND ONE IN EACH RETURN. MULTIPLE UNITS USING INTERMEDIATE MULLIONS (SHOWN BELOW) MAY BE USED WHEN DES. REQ. IN WHICH CASE TABLE WILL NOT APPLY.

AS SHOWN ON DETAILS, OUTER CONSTRUCTION MAY BE FACE BRICK OR STONE OR WOOD TRIM WHEN FACE BRICK OR STONE OCCURS AT HEAD OF WINDOWS. PROVISION MUST BE MADE TO SUPPORT THE UNITS AT CORNER MULLIONS.

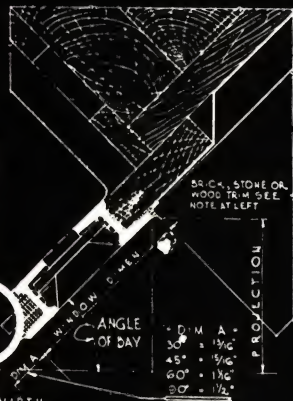
WHEN PIPE MULLIONS ARE SPECIFIED, ONLY THOSE DETAILED ON THIS SHEET WILL BE FURNISHED.



INTERMEDIATE MULLION



VERTICAL SECTION AT MULLION

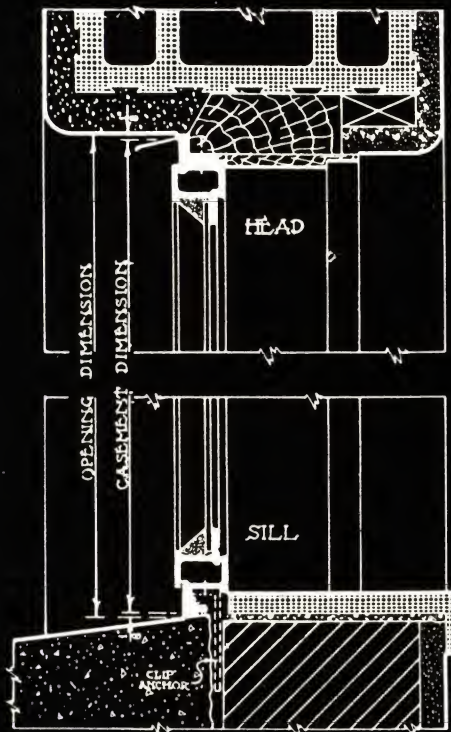


- SQUARE BAY
- HORIZONTAL SECTIONS
- SPRAYED BAY

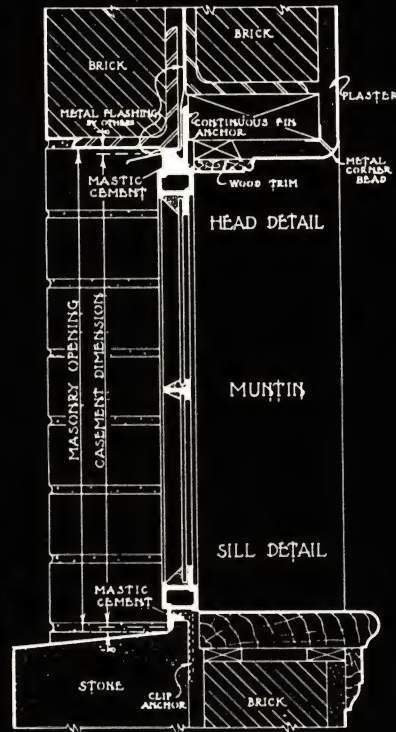
VENTO RESIDENCE CASEMENTS

MISCELLANEOUS INSTALLATION DETAILS

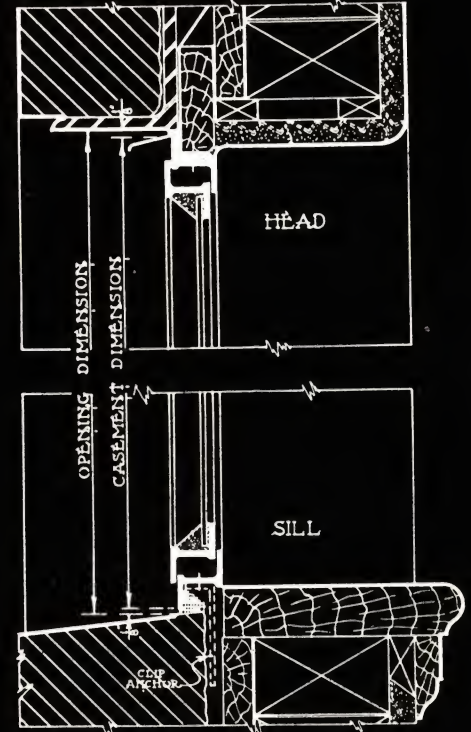
Our Engineering Department Will Gladly Prepare Details for Special Conditions



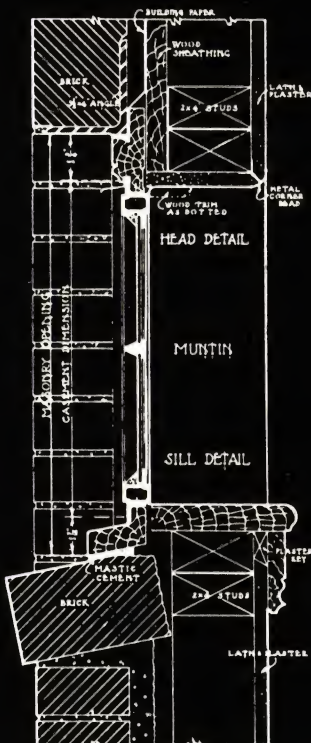
TILE AND STUCCO



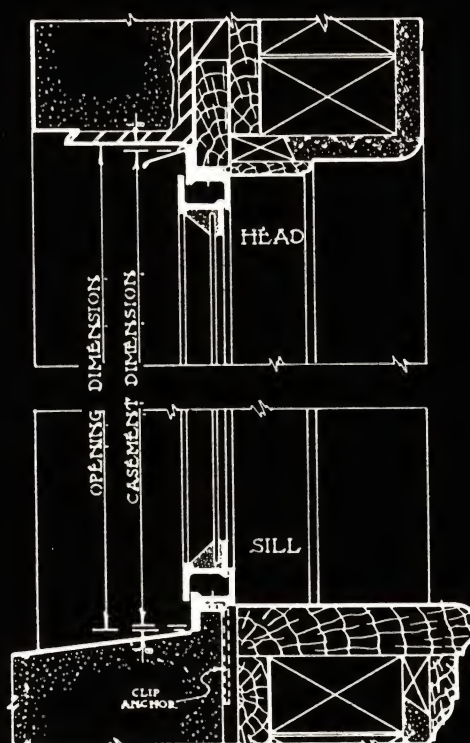
DETAILS FOR SOLID BRICK



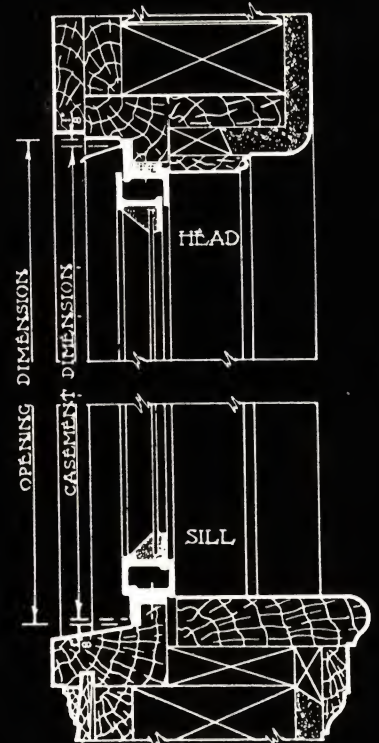
BRICK VENEER
WITH WOOD ANCHORING STRIP



BRICK AND STONE VENEER
WITH SURROUNDS



STONE TRIM



FRAME CONSTRUCTION

VENTO INTERMEDIATE SECTION WINDOWS

CASEMENTS AND COMBINATION PROJECTED CASEMENTS

PROJECTED WINDOWS OF CASEMENT SECTIONS

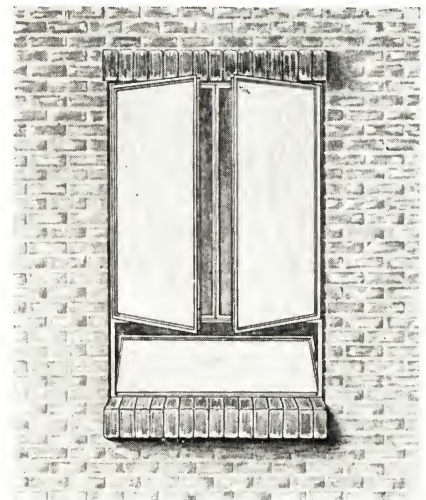


Intermediate Casement with Side Hinged Ventilator

Vento intermediate windows in weight of section, care in manufacture, hardware details and finish make this line worthy of the finest structure.

Bronze hardware is standard for all intermediate section types and a wide range of standard sizes are available.

See following pages.

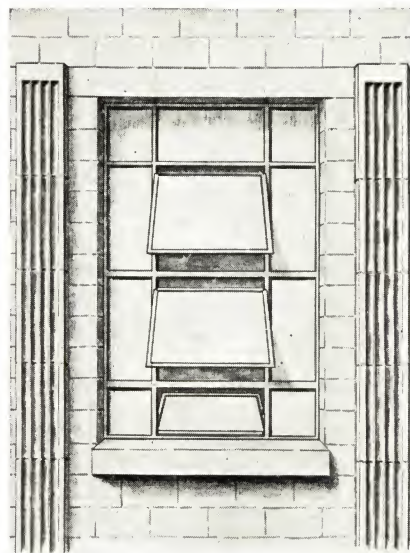


Casement Combination. Top Ventilators Hinged at Jambs to Open Out. Sill Ventilator to Tilt In



Intermediate casement illustrated above, left, is the standard window for the finest homes. Furnished in both screened and non-screen type.

Flat screens of steel, aluminum or bronze are available.



Projected Casements. Upper Ventilators Project Out; Sill Ventilator Projects In

The projected and combination types illustrated are especially suited for the better class of school, institutional, commercial and public construction.

The heavy casement sections and workmanship plus standardization permit the availability of this superb quality for the purposes of such construction.



NOTE: Custom Built Casements of Heavy Section Are Also Available. Full Data on Request

SECTIONS SHOWN ARE HALF FULL SIZE

VENTO INTERMEDIATE SECTION CASEMENTS

STANDARD TYPES AND SIZES

	1'-1 1/8"	1'-7 7/8"	1'-7 7/8"	3'-2 3/8"	3'-2 3/8"	3'-2 3/8"	4'-9 1/4"	4'-9 1/4"	4'-9 1/4"
1'-2 1/4"									
2'-4 1/8"									
2'-4 1/8"									
3'-1"									
3'-1"									
4'-0 3/8"									
4'-0 3/8"									
4'-11 3/4"									
4'-11 3/4"									
5'-11 1/8"									
5'-11 1/8"									
6'-10 1/2"									

GLASS SIZES

Pane	Size
A	8 x 11
B	10 1/8 x 11 1/4
C	9 1/8 x 11
D	8 1/4 x 11 1/4
E	10 3/8 x 11
F	8 1/4 x 11
G	9 1/8 x 11
H	9 1/8 x 11 1/4
J	9 1/8 x 11 3/4
K	9 1/8 x 11 1/2
L	8 1/4 x 11 1/2
M	8 1/4 x 11
N	11 1/2 x 10 1/2
O	9 1/8 x 10 3/4
P	8 1/4 x 10 3/4
Q	9 1/8 x 11
R	8 1/4 x 11
S	8 1/4 x 10
T	8 1/2 x 11

Lights not lettered are size "A."

NOTES

Sizes given are exact sash sizes. One-eighth inch must be allowed on all sides for sash clearance. If more than one type is used in the same opening add 1/4" to the sum of the sash sizes for each mullion or transom used to determine the overall sash size.

Handing of casements is determined by location of hinges.

Viewed from outside, right-hand casements being hinged at right, left-hand being hinged at left.

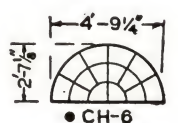
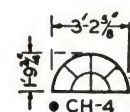
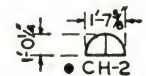
VC—Ventilator in center

T—Transom vent

—Stock types

Side hinged vents are outward opening. All types furnished with partial or complete omission of muntins when required.

TRANSOM UNITS



CASEMENT PROJECTED WINDOWS

STANDARD TYPES AND SIZES

Widths and heights of units increase by 6" from minimum to maximum dimensions given

W = Widths
H = Heights

SEE PAGE 10 FOR SECTIONS



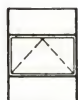
TYPE-A
W-1'-6" TO 4'-6"
H-1'-0" TO 9'-0"



TYPE-B
W-1'-6" TO 4'-6"
H-1'-0" TO 4'-0"



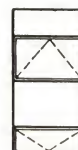
TYPE-C
W-1'-6" TO 4'-6"
H-3'-0" TO 6'-0"



TYPE-D
W-1'-6" TO 4'-6"
H-4'-6" TO 7'-0"



TYPE-E
W-1'-6" TO 4'-6"
H-4'-6" TO 7'-0"



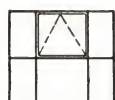
TYPE-F
W-1'-6" TO 4'-6"
H-6'-6" TO 9'-0"



TYPE-G
W-1'-6" TO 4'-6"
H-6'-6" TO 9'-0"



TYPE-H
W-4'-0" TO 7'-0"
H-1'-0" TO 4'-0"



TYPE-J
W-4'-0" TO 7'-0"
H-3'-0" TO 6'-0"



TYPE-K
W-4'-0" TO 7'-0"
H-4'-6" TO 7'-0"



TYPE-L
W-4'-0" TO 7'-0"
H-4'-6" TO 7'-0"



TYPE-M
W-4'-0" TO 7'-0"
H-6'-6" TO 9'-0"



TYPE-N
W-4'-0" TO 7'-0"
H-6'-6" TO 9'-0"



CASEMENT COMBINATION WINDOWS

STANDARD TYPES AND SIZES

Widths for units B and C increase by 3" from minimum to maximum dimensions given.
Balance of units increase by 6" from minimum to maximum dimensions given.
Heights of all units increase by 6" from minimum to maximum dimensions given.

W = Width
H = Height

SEE PAGE 10 FOR SECTIONS



TYPE-A
W-1'-6" TO 4'-6"
H-4'-6" TO 9'-0"



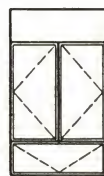
TYPE-B
W-1'-6" TO 2'-6"
H-4'-6" TO 7'-6"



TYPE-C
W-1'-6" TO 2'-6"
H-5'-6" TO 9'-0"



TYPE-D
W-2'-6" TO 4'-6"
H-4'-6" TO 7'-6"



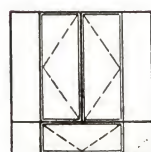
TYPE-E
W-2'-6" TO 4'-6"
H-5'-6" TO 9'-0"



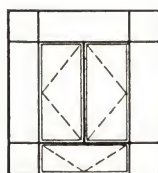
TYPE-F
W-2'-6" TO 4'-6"
H-4'-6" TO 7'-6"



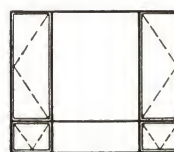
TYPE-G
W-2'-6" TO 4'-6"
H-5'-6" TO 9'-0"



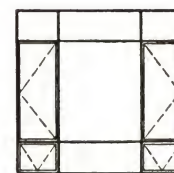
TYPE-H
W-5'-0" TO 7'-6"
H-4'-6" TO 7'-6"



TYPE-J
W-5'-0" TO 7'-6"
H-5'-6" TO 9'-0"



TYPE-K
W-5'-0" TO 7'-6"
H-4'-6" TO 7'-6"



TYPE-L
W-5'-0" TO 7'-6"
H-5'-6" TO 9'-0"

SPECIFICATIONS—VENTO CASEMENTS

The following specification notes will be useful to specification writers, covering all types of Vento Steel Casements

1. GENERAL: All steel casements shown on drawings shall be of the (Insert whether DeLuxe, Simplex or Economy residence type) or (casements, projected casements or combination casements of the intermediate section type) as manufactured by the VENTO STEEL PRODUCTS COMPANY of Muskegon, Michigan, or equal.

2. MATERIAL: Frame and ventilator sections shall be hot-rolled new Billet steel providing two point weathering contact between ventilator and frame. Corners of frame and ventilator sections to be mitred and welded, all welds being ground to a smooth finish. All steel hardware parts shall be heavily cadmium plated before painting.

3. HARDWARE: Provide (standard medium statuary finish or full polished bronze) hardware according to manufacturers' standards for the type of window above specified. (Include here whether quadrant or rotary type underscreen operator desired.)

All side hung swing leaves shall open on heavy, extended cleaning hinges solidly welded to casement frame.

NOTE: Add following specifications if sill or transom units are used. Hardware for tilt-in sill units to match hardware of other casements. Transom units shall be equipped with push type locking bar.

4. SCREENS FOR CASEMENTS WITH UNDER-SCREEN OPERATORS: Provide $\frac{5}{8}$ " flat tubular frame screens for all ventilator openings. Frame to be made of electro galvanized steel solidly welded and finished with baked-on enamel. Screen cloth shall be 16-mesh antique bronze wire.

HINGED SCREENS FOR CASEMENTS WITHOUT UNDERSCREEN OPERATORS: Supply standard Vento Side Hinged Screens with $\frac{5}{8}$ " tubular steel

frame, frame to be made of electro galvanized steel with baked enamel finish. Screen cloth to be of 16-mesh antique bronze wire.

NOTE: SCREENS: Aluminum, bronze or stainless steel screen frames can be supplied on order. Screen cloth can be bronze, aluminum or Inconel metal, the latter being generally used with stainless steel screens under atmospheric conditions of considerable corrosion.

5. SHADING: All casements shall be drilled to receive shade brackets. Shade brackets furnished under another heading.

6. MASTIC: Provide sufficient mastic cement for embedding casements. (Pointing and caulking, if desired, by others.)

7. ANCHORS: Specifications should state which of the several alternative methods of anchorage are required: Viz.: Wood screws, continuous fin anchors (for solid masonry) or Redwood Surrounds. Anchorage materials will be supplied in accordance with this specification.

8. GLAZING: Provide necessary spring wire glazing clips. (Glass, putty and glazing under separate heading.)

9. ERECTION: Casements shall be set in accordance with the manufacturer's instructions (or by manufacturer's erection forces if desired).

10. PAINT: Casements shall receive coat of manufacturer's standard paint applied at the factory before shipment.

ARCHITECTURAL PROJECTED WINDOWS

FOR SCHOOLS, OFFICES AND COMMERCIAL BUILDINGS, INSTITUTIONAL
STRUCTURES AND ALL MAJOR CONSTRUCTION

Standard Sizes and Types Shown on Page 15



Type M Architectural Projected Window
with Ventilator Closed

This is a high-grade, heavy section, projected window, the ventilator movement being through the medium of heavy bronze adjustable friction shoes riding in guides concealed in the weathering.

Supplied for either inside or outside putty glazing or inside angle glazing. See section details page 16.

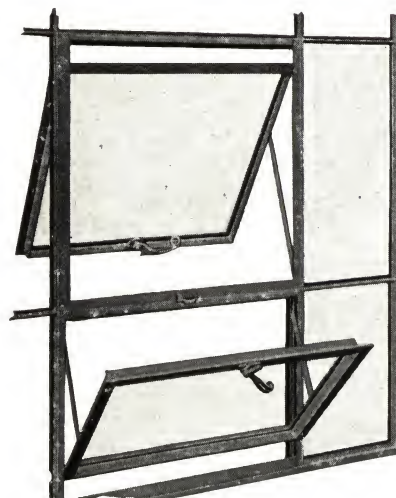
Hardware is fully Polished Solid Bronze. Adjacent ventilators as illustrated are provided with combination latch and strike.

Either equal or unequal leg frame sections are available. The equal leg construction is recommended for schools and other installations where simplicity of interior trim details is desired. Only a single rebate in the masonry is necessary and the interior trim can be carried direct to the window frame itself. The use of this equal leg section makes an exceedingly strong and rigid window construction.

Unusual attention is given to the assembly of these windows to insure perfect operation. Completely welded in jig frames; proper alignment, tight weathering, and thorough rigidity become inbuilt features of this Vento line.

Mullions, where required, are supplied with heavy plate covers.

Windows are given one coat of priming paint before shipping.



Detail of Window Construction and
Operation of Adjacent Ventilators

ARCHITECTURAL PROJECTED WINDOWS

Architectural projected windows where shown on the drawings shall be those as manufactured by the VENTO STEEL PRODUCTS COMPANY, Muskegon, Michigan, or equal, and shall be of the sizes and types as shown.

MATERIALS: Frame members shall be heavy specially designed—(equal or unequal)—leg section, allowing $\frac{3}{8}$ " continuous anchorage. The muntins to be special formed T sections. Vertical mullions where indicated are to be manufacturer's standard hot rolled T sections with formed Steel Mullion Covers.

CONSTRUCTION:

NOTE: Specify here whether windows are to be designed for inside or outside putty glazing or inside angle glazing.

Frames and ventilators shall be assembled by tenoned, riveted and welded joints. Continuous two point contact weathering shall be provided between ventilators and frames.

Venilators to be accurately supported on solid steel arms and bronze adjustable friction shoes, the latter riding vertically in concealed guides.

Window manufacturer shall furnish necessary clips, anchors and bolts for window installation.

NOTE: Steel specification should refer to such punching as is necessary for the attachment of structural clips.

HARDWARE: All hardware shall be solid bronze full polished. Open-out ventilators within reach of manual operation to be equipped with Vento standard bronze ring type cam handle. Open-out vents beyond reach of manual operation shall additionally be equipped with pull down pole head ring.

Open-in ventilators shall be equipped with handle and keeper, all hardware to match in design and finish. Where such vents are beyond reach of manual operation, hardware to be bronze spring catch for pole operation.

ERECTION: All windows to be set plumb and true in prepared openings; and to be properly aligned and securely anchored prior to glazing.

NOTE: Mention in masonry specification that all openings are to be accurately constructed in accordance with manufacturer's details and also mention that all mortar, grouting and pointing shall be done by the masonry contractor after the windows are set.

NOTE: Mention under structural steel specification, where required, that all structural work forming a part of the window framing is to be provided by the steel contractor and punching in same to be in accordance with window manufacturer's details.

PAINTING: All windows to receive one shop coat of window manufacturer's standard shop paint.

NOTE: Windows should be given a field coat of paint after erection but before glazing, the final field coat not to be applied until putty has thoroughly set—usually about three weeks.

GLASS AND GLAZING:

NOTE: Glass and glazing are not a part of the window contract. The following, however, may be noted.

Specify glass thickness. Single strength glass is not recommended. Specify a high grade steel window putty. Do not permit wood sash putty to be used.

For putty glazing specify that glass shall be bedded and the putty applied in a neat and clean cut manner.

For angle glazed windows specify that the glass shall be set in bed putty and held by glazing angles.

SCREENS:

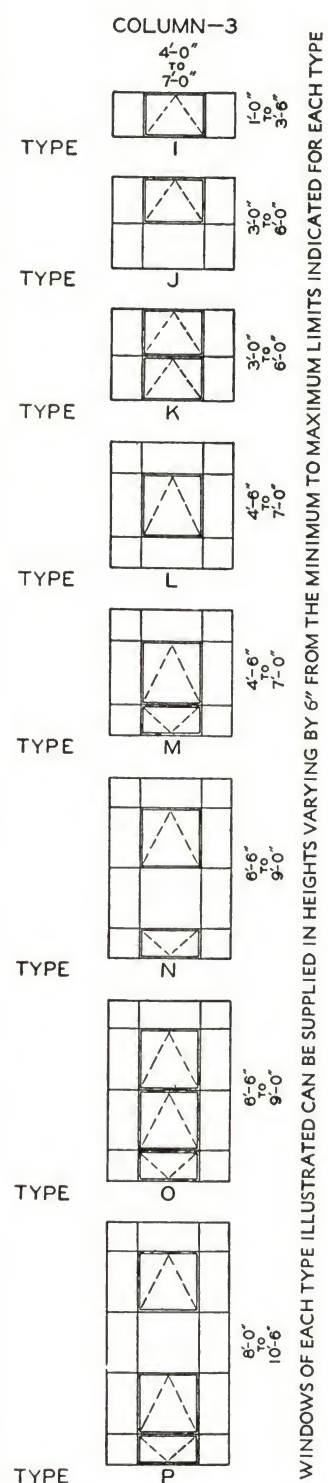
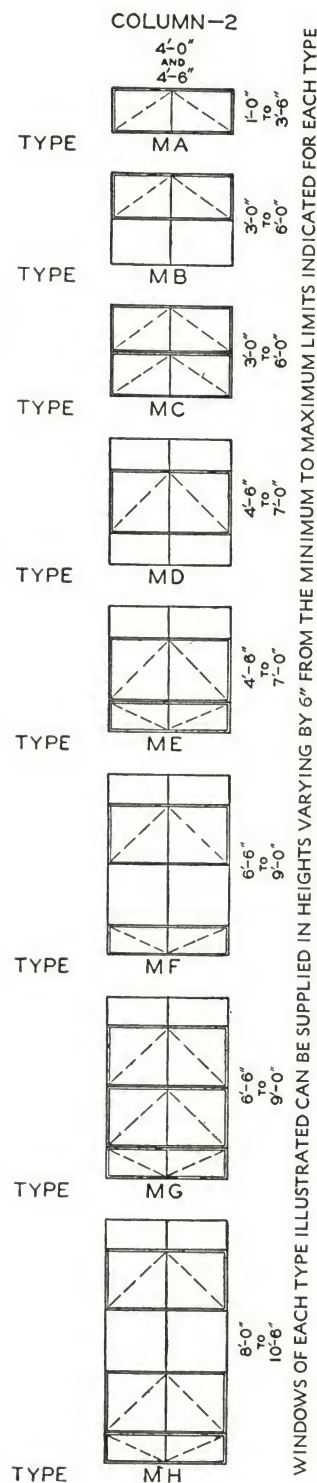
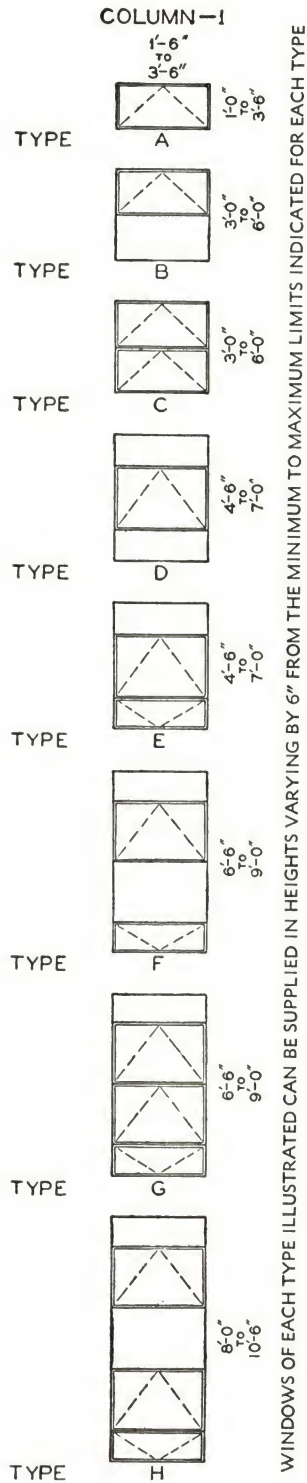
NOTE: Vento standard flat screens can be applied to the outside of architectural projected windows with project-in ventilators. No change in hardware is necessary.

Screening project-out vents with inside flat screens requires under-screen hardware, which when specified is supplied in bronze.

ARCHITECTURAL PROJECTED WINDOWS

STANDARD TYPES AND SIZES

Windows of the type illustrated in columns one and three, can be supplied in widths varying by 6" from the minimum to maximum limits indicated. Windows of the muntin bar type illustrated in column two, can be supplied only in the two widths noted.



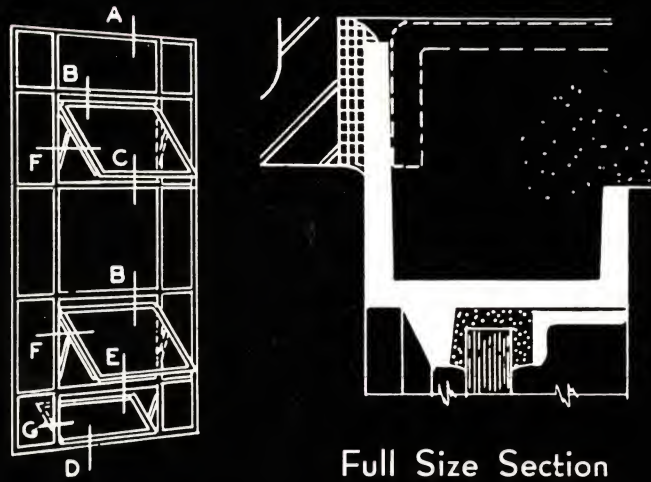
ARCHITECTURAL PROJECTED WINDOWS

ASSEMBLY AND INSTALLATION DETAILS

Full size sections at top show both inside angle glazing and outside putty glazing.
Installation and section assemblies below apply to either.

DETAILS INDICATE RECOMMENDED CAULKING POINTS
WHERE SUCH IS REQUIRED OR SPECIFIED

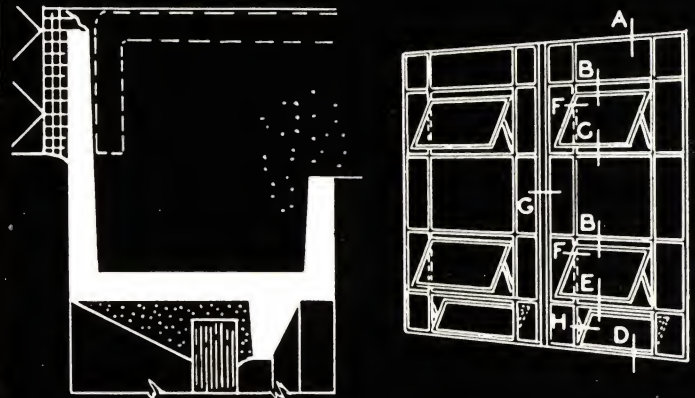
Glazed Inside



Full Size Section

OUTSIDE VIEW
VENTILATORS PARTLY OPEN

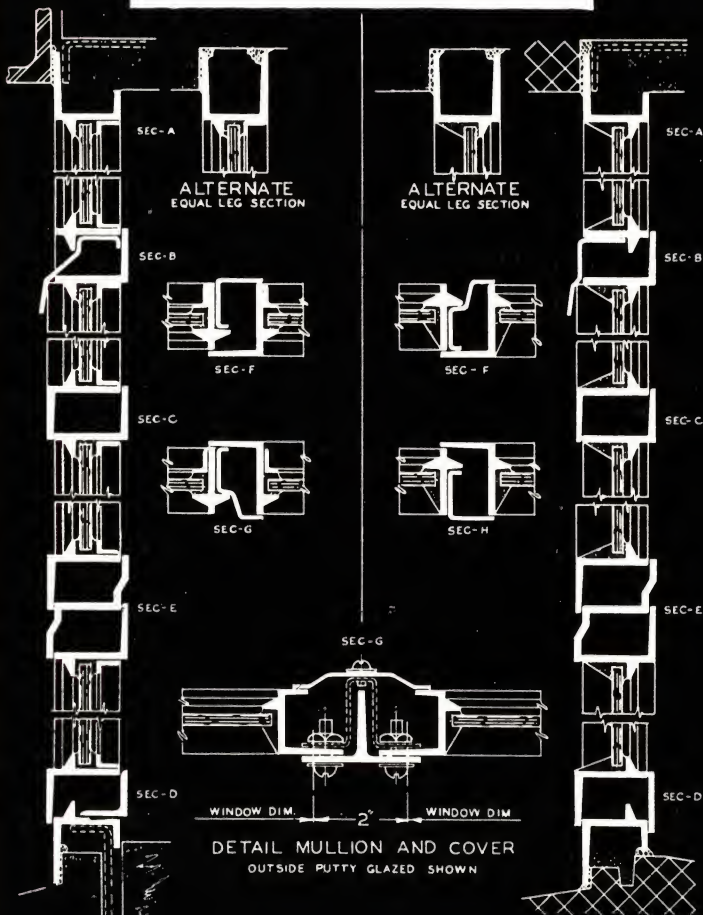
Putty Glazed Outside



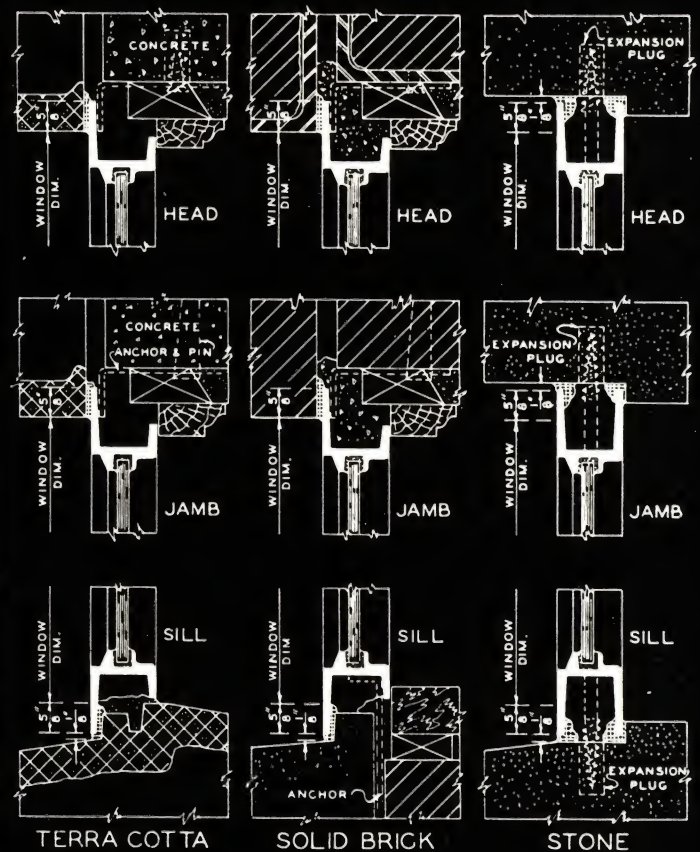
Full Size Section

OUTSIDE VIEW
VENTILATORS PARTLY OPEN

ASSEMBLY DETAILS



INSTALLATION DETAILS



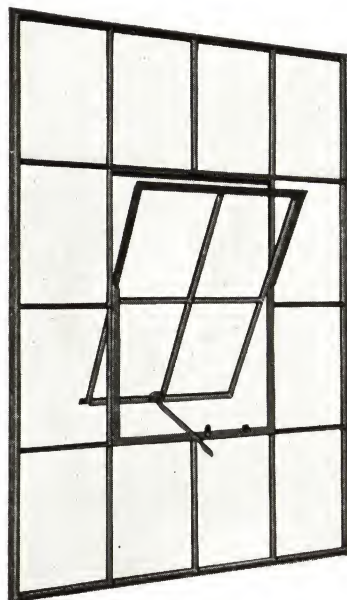
INDUSTRIAL AND COMMERCIAL STEEL WINDOWS

Made with Two Standard Types of Ventilators:

Installation Details on Page 25

Standard Sizes on Pages 18 and 20

PIVOTED AND PROJECTED



Pivoted Type

These windows are made of full 1 $\frac{3}{8}$ -inch section under air hammer assembly and arc welding. The most rigid window made.

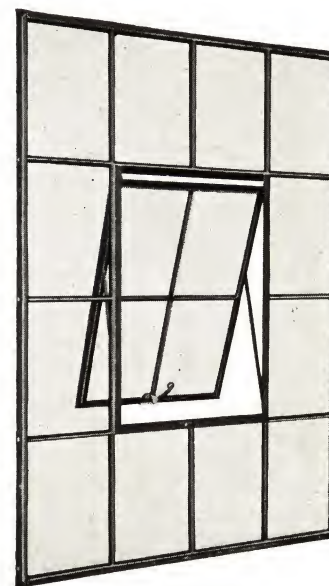
Pivoted ventilators have concealed hinges operating on bronze pins.

Projected vents have adjustable friction through the medium of sliding bronze shoes.

Standard hardware is solid bronze semi-finished.

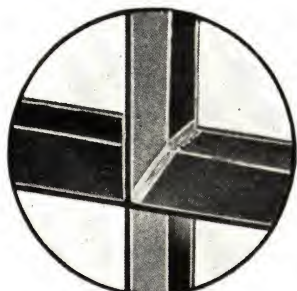
Standard window finish is a high-grade brown oxide paint. Permalum (aluminum with asphalt base) is available on special order.

Flat screens supplied for both pivoted and projected windows. Pivoted windows to be screened require special preparation and special hardware. Projected windows with inward opening vents when screened show greater economy.



Projected Type

THE INTEGRAL WELDED CONSTRUCTION OF VENTO WINDOWS



Main Joints

Assembly of main intersections are such as prevents distortion of steel in fabrication, assembly or welding

Intersection of muntin and frame are of tenon construction securely air hammered

All Vento Windows are assembled and welded in master frames insuring perfect alignment. Vento welded construction retains this alignment permanently.

Full Depth and Weight of Sections
Electric Arc Welding
Highest Quality Oxide Paint
No Distortion of Steel in Fabrication
Mortise and Tenon Construction
Hand Fitted Ventilators and Weathering

The initial assembly of frame members is by tenon construction. These tenons are securely air hammered. Vento windows however do not rely on these hammered tenons for final strength. Following the jig assembly, MAIN JOINTS are welded, making EVERY WINDOW AN INTEGRAL STRUCTURAL FRAMEWORK.

The Vento welding process, developed in our own shops, accomplishes a clean, smooth joint that does not interfere with glass or glazing, yet actually fuses the metal together, producing an integral weathertight construction not secured by other methods.



Vent Corner

Vent Corners are fully welded as shown and in addition are mortised and tenoned. An absolutely rigid assembly

Ventilator Corners receive especial care. They are separately aligned and welded throughout

VENTO PERMALUM FINISH

The standard finish on all Vento Steel Sash is a high grade chromatic oxide oil paint and all material unless otherwise specified will be so shipped.

Our special PERMALUM finish is a metallic aluminum corrosion resistant embodying the well known preservative properties of pure

aluminum. This is applied through the medium of Gilsonite Asphalt by an exclusive Vento process which achieves a lustrous silvery finish that gives the absolute maximum in the practical preservation of steel.

PERMALUM finished windows are available on special order.

INDUSTRIAL AND COMMERCIAL STEEL WINDOWS

THREE LIGHTS WIDE			FOUR LIGHTS WIDE			FIVE LIGHTS WIDE			SIX LIGHTS WIDE		
TWO LIGHTS WIDE											
WIDTH											
12" X 18"			4'-2 3/4"			5'-2 3/4"			6'-3 1/8"		
14" X 20"			4'-0 3/8"			6'-0 3/8"			7'-3 1/8"		
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											
14" X 20"											
12" X 18"											

COMMERCIAL WINDOWS WITH PIVOTED VENTILATORS

VENTO COMMERCIAL WINDOWS are of integral construction—the ventilators being solidly welded. The sections are of full depth, weight and strength; and all accessory assembly factors match this quality in every respect. Hardware is interchangeable on standard brackets. Lock bars are of steel, and are heavily painted. All other hardware is a special tough alloy of great strength, and guaranteed rustproof. Solid bronze in any finish is also available.

SCREENING

Standard pivoted windows are hinged $2\frac{3}{4}$ inches above center to provide the gravity self-closing feature. When such ventilators are to be screened, hinging is *exactly at center* in order to secure symmetrical contact between the ventilator and screen frames; and the window is provided with the special hardware illustrated below comprising friction stay arm and the special head catch noted.



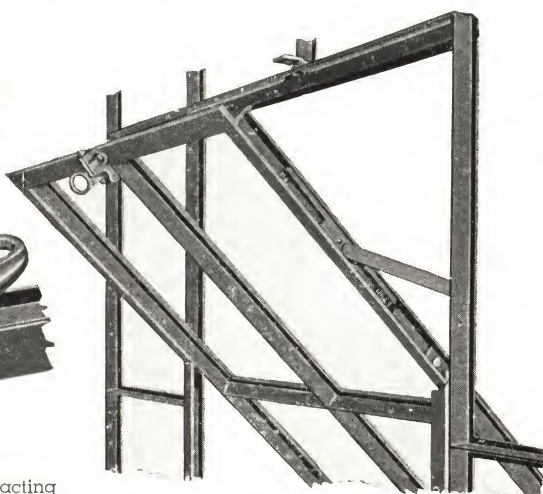
Optional Sill Catch and Chain Hardware No. 719. Head Idler Roller No. 703 is part of this hardware



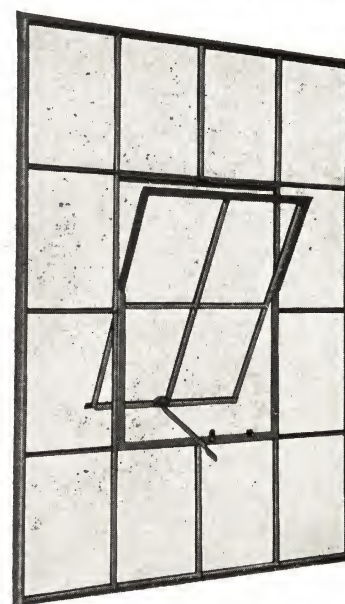
Optional Gravity Type Self-acting Cam Handle Hardware No. 604

These details apply only to pivoted windows specifically prepared for screens at the time of manufacture. Such screens cannot be applied to pivoted windows built without this special preparation.

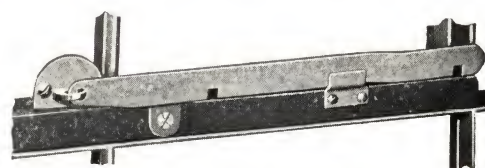
NOTE: Projected windows with inward opening vents and flat outside screens (see Page 21) are more economical.



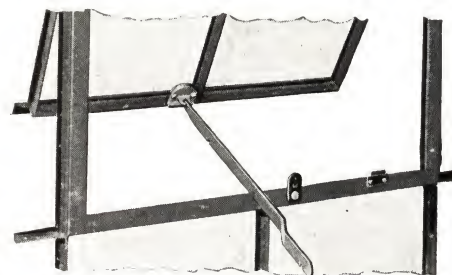
Hardware for Screened Pivoted Window



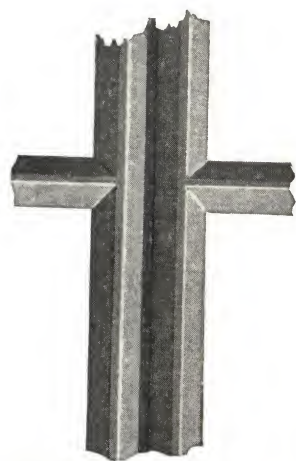
Type 44141 Pivoted Window.
No. 505 Lock Bar Hardware



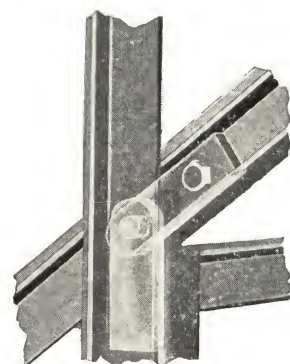
Lock Bar No. 505 in Closed Position



Lock Bar No. 505 in Open Position



Front View of Hinge. Note the Neat Tight and Weatherproof Assembly



Open Position of Ventilator Showing Concealed Hinge Construction



Inside View of Hinge. Surface is Entirely flush and Tight

Hinges are entirely concealed and of the strongest possible construction being made of $\frac{1}{8}$ " plate steel. Hinge pins are of heavy solid bronze.

UNDERWRITERS' Labeled Windows Can Be Supplied

Maximum width for single window openings are 8' 6"; height 12' 0".

Maximum area fixed units 80 square feet. Maximum area Vented units 75 square feet.

Maximum vent area per window 40 square feet.

Maximum number of vents—3 per window.

Units in multiple openings must not exceed 7' 0" in width.

Maximum exposed glass area per light 350 square inches.

INDUSTRIAL AND COMMERCIAL WINDOWS

PROJECTED VENTILATORS . . . STANDARD TYPES AND SIZES

TWO LIGHTS
WIDE
12 X 18
2'-1 1/2"
14 X 20
2'-5 3/4"

THREE LIGHTS WIDE
3'-2"
3'-6"

FOUR LIGHTS WIDE
4'-2 3/4"
4'-10 3/4"

FIVE LIGHTS WIDE
5'-2 3/4"
6'-0 3/4"



2240
3'-5 3/4"



32160
3'-1 1/2"

AREA TABLE 12 SIZES		WINDOW AREAS SQ. FT.	
LIGHTS WIDE		LIGHTS WIDE	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100



42140
4'-10 3/4"

AREA TABLE 14 SIZES		WINDOW AREAS SQ. FT.	
LIGHTS WIDE		LIGHTS WIDE	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100



52160
5'-2 3/4"

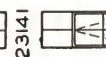
AREA TABLE 16 SIZES		WINDOW AREAS SQ. FT.	
LIGHTS WIDE		LIGHTS WIDE	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100



54162
6'-0 3/4"

AREA TABLE 18 SIZES		WINDOW AREAS SQ. FT.	
LIGHTS WIDE		LIGHTS WIDE	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

GLASS SIZES FOR 14" X 20" SASH UNITS



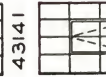
23141
6'-2 3/4"



33161
6'-10 3/4"



34162
6'-2 3/4"



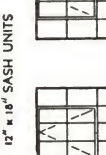
44141
6'-10 3/4"



4422402
6'-10 3/4"



54161
6'-10 3/4"



54162
6'-10 3/4"



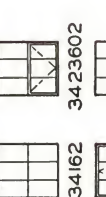
54162
6'-10 3/4"



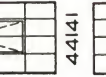
2541
7'-8 3/4"



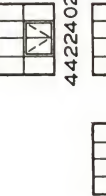
35162
7'-8 3/4"



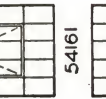
35163
7'-8 3/4"



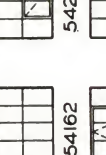
45141
7'-8 3/4"



45142
7'-8 3/4"



55161
7'-8 3/4"



55163
7'-8 3/4"



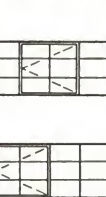
55163
7'-8 3/4"



2541
8'-6 3/4"



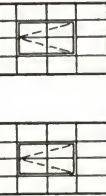
35163
8'-6 3/4"



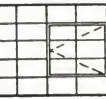
3523602
8'-6 3/4"



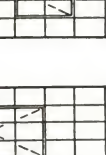
45141
8'-6 3/4"



4522402
8'-6 3/4"



55161
8'-6 3/4"



5523602
8'-6 3/4"



552603
8'-6 3/4"



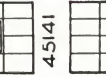
2541
9'-3 3/4"



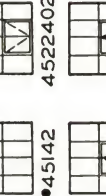
35163
9'-3 3/4"



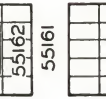
3523603
9'-3 3/4"



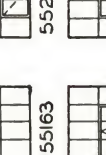
45141
9'-3 3/4"



4522403
9'-3 3/4"



55161
9'-3 3/4"



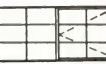
5523603
9'-3 3/4"



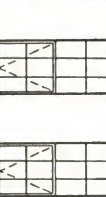
552603
9'-3 3/4"



2541
10'-3 3/4"



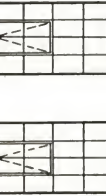
35163
10'-3 3/4"



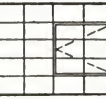
3523603
10'-3 3/4"



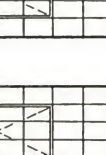
45141
10'-3 3/4"



4522403
10'-3 3/4"



55161
10'-3 3/4"



5523603
10'-3 3/4"



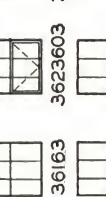
552603
10'-3 3/4"



2541
11'-11 1/2"



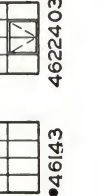
35163
11'-11 1/2"



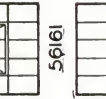
3523603
11'-11 1/2"



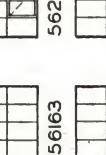
45141
11'-11 1/2"



4522403
11'-11 1/2"



55161
11'-11 1/2"



5523603
11'-11 1/2"



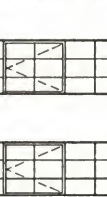
552603
11'-11 1/2"



2541
12'-9 1/2"



35163
12'-9 1/2"



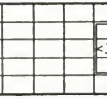
3523603
12'-9 1/2"



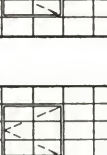
45141
12'-9 1/2"



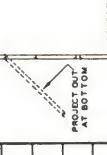
4522403
12'-9 1/2"



55161
12'-9 1/2"



5523603
12'-9 1/2"



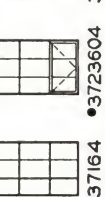
552603
12'-9 1/2"



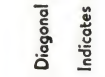
2541
14'-20"



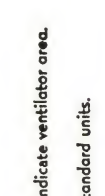
35163
14'-20"



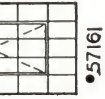
3523603
14'-20"



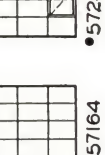
45141
14'-20"



4522403
14'-20"



55161
14'-20"



5523603
14'-20"



552603
14'-20"



2541
14'-20"



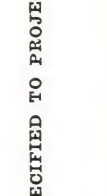
35163
14'-20"



3523603
14'-20"



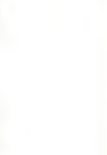
45141
14'-20"



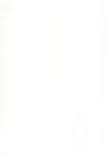
4522403
14'-20"



55161
14'-20"



5523603
14'-20"

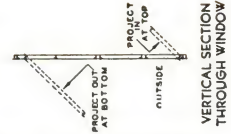


552603
14'-20"

NOTE: Diagonal lines indicate ventilator area.

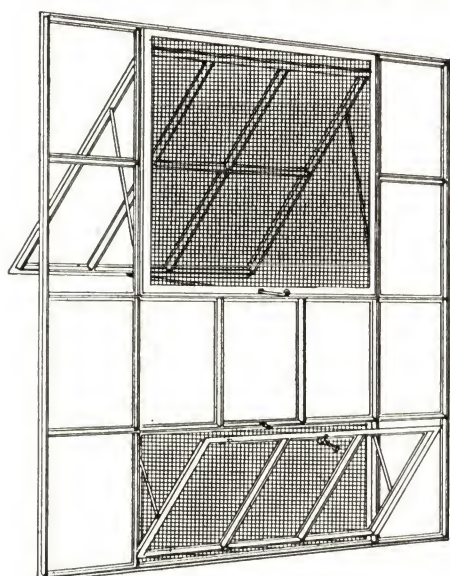
● Indicates non-standard units.

VENTS MAY BE SPECIFIED TO PROJECT-IN OR-OUT



COMMERCIAL WINDOWS WITH PROJECTED VENTILATORS

PROJECTED WINDOWS ARE DRILLED AND TAPPED TO RECEIVE SCREENS



Project-out Top Vent with Inside Screen and Underscreen Hardware No. 800; and Projected In Sill-vent with Cam Locking Handle No. 660 and Outside Screen

The construction of Vento commercial projected windows is the same as the pivoted ventilator type. Ventilators operate smoothly and entirely without racking.

The operation is through the medium of adjustable bronze shoes moving in side guides. All hardware is our high test alloy, guaranteed rust-proof. Bronze hardware in any finish also available.

Recommended screening arrangements provide for flat outside screens and project-in vents.

Screening project-out vents require either a hinge screen with a box frame of sufficient depth to clear the locking handle when the window is closed; or underscreen hardware. The latter is illustrated below.

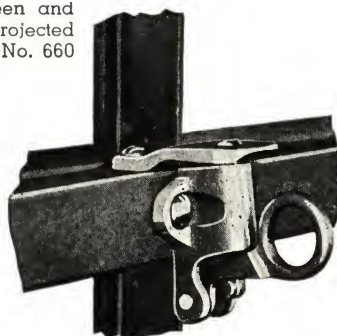
Project-in sill vent hardware matches cam handle No. 604 shown below.



Commercial Projected Window Type 44141. Vents may be specified to project in or out



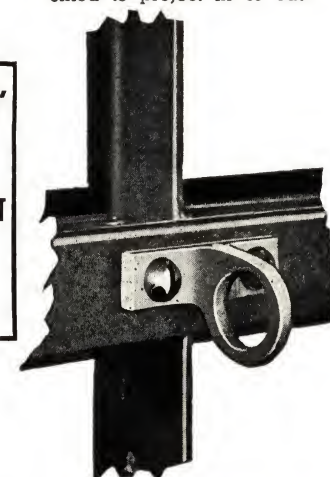
Cam Handle Hardware No. 604 for Unscreened Project-out Vents



Head Catch No. 717 for Project-in Top Vents

**UNDERWRITERS'
LABELED
WINDOWS CAN
BE SUPPLIED**

See page 19



Pull-down Head Ring No. 652



Detail of Adjustable Friction Slide and Guide

EXPLOSION HARDWARE

The special sill lock shown below is supplied where explosion hazards require a self-opening mechanism. Adjustable for pressure.



Explosion Lock No. 776



Underscreen Bar-lock No. 800 with Window Opened. The operation is through the window frame without moving the screen. This bar swivels to the locking position as shown to the left



Detail of Hardware No. 800 in Closed and Locked Position

VENTO

VENTO INDUSTRIAL AND COMMERCIAL WINDOWS

FIXED WINDOWS AND CURVED TRANSOMS

WIDTH

12 X 18 2'-1 1/8"
14 X 20 2'-5 1/8"

3'-2"
3'-8"

4'-2 3/8"
4'-10 3/8"

5'-2 3/4"
6'-0 3/4"

6'-3 1/8"
7'-3 1/8"

CURVED HEAD TRANSOMS NON-VENTILATING

1'-7 1/4"
1'-9 1/4"



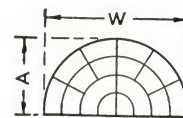
•31



•41

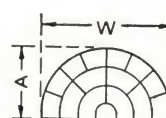


•51



S 84

12'X18' 14'X20'
W-8'-6 3/8" W-9'-10 3/8"
A-4'-3 3/8" A-4'-11 3/8"



S 74

12'X18' 14'X20'
W-7'-9 1/4" W-8'-11 1/4"
A-3'-10 3/8" A-4'-5 3/8"

3'-1 1/8"
3'-5 1/8"



•22



32



42



52



•62

4'-8"
5'-2"



33



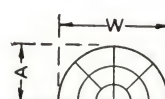
43



53

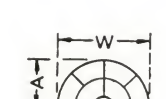


•63



S 63

12'X18' 14'X20'
W-8'-6 3/8" W-7'-3 1/8"
A-3'-1 1/8" A-3'-7 1/8"



S 53

12'X18' 14'X20'
W-5'-2 3/8" W-6'-0 3/8"
A-2'-7 3/8" A-3'-0 3/8"

6'-2 3/8"
6'-10 3/8"

Glass sizes for all rectangular lights are 12 x 18 or 14 x 20.



34



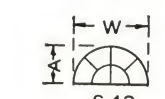
44



54

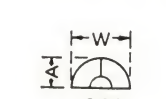


•64



S 42

12'X18' 14'X20'
W-4'-2 3/8" W-4'-10 3/8"
A-2'-1 3/8" A-2'-5 3/8"



S 32

12'X18' 14'X20'
W-3'-2" W-3'-8"
A-1'-7" A-1'-10"

7'-8 3/4"
8'-6 3/4"

For window areas see page 17.



35



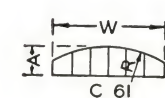
45



55

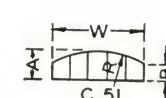


•65



C 61

12'X18' 14'X20'
W-6'-3 3/8" W-7'-3 3/8"
A-1'-6 1/8" A-1'-8 1/8"
B-8 1/8" B-8 7/8"
R-6'-3 1/8" R-7'-3 1/8"



C 51

12'X18' 14'X20'
W-5'-2 3/8" W-6'-0 3/8"
A-1'-6 1/8" A-1'-8 1/8"
B-9 1/8" B-10 3/8"
R-5'-2 3/8" R-6'-0 3/8"

9'-3 1/8"
10'-3 1/8"



36



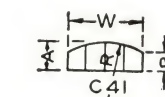
46



56

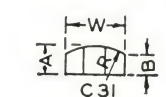


•66



C 41

12'X18' 14'X20'
W-4'-2 3/8" W-4'-10 3/8"
A-1'-6 1/8" A-1'-8 1/8"
B-11 3/8" B-1'-0 3/8"
R-4'-2 3/8" R-4'-10 3/8"



C 31

12'X18' 14'X20'
W-3'-2" W-3'-8"
A-1'-6 1/8" A-1'-8 1/8"
B-1'-1" B-1'-2 1/4"
R-3'-2" R-3'-8"

10'-9 1/2"
11'-11 1/2"



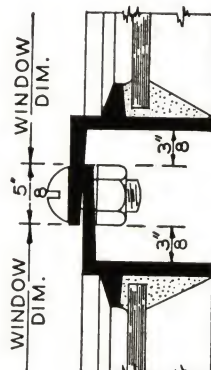
•37



47



•57



WINDOW DIM.
WINDOW DIM.

HEIGHT

12 X 18
14 X 20

UNDERWRITERS' Labeled Windows Can Be Supplied

Maximum width for single window openings are 8' 6"; height 12' 0".

Maximum area fixed units 80 square feet. Maximum area Vented units 75 square feet.

Maximum vent area area per window 40 square feet.

Maximum number of vents—3 per window.

Units in multiple openings must not exceed 7' 0" in width.

Maximum exposed glass area per light 350 square inches.

NOTE

In ordering windows use the symbol numbers given in the diagrams above, preceded by the glass size (12" x 18" or 14" x 20").

EXPLANATION OF SYMBOLS

Circle Head units are designated by the letter S

Camber Head units are designated by the letter C

The first numeral is lights wide, the second lights high

W—width
B—height at side
A—height at center of arch
R—radius

Standard curved transoms up to six lights wide are made to fit rectangular units with which they are used.

Curved units over six lights wide are used over multiple combinations of rectangular sash, requiring the use of vertical and horizontal mullions. See page 23.

Single units up to six lights wide can be bolted vertically together as shown in detail above. Larger openings require mullions. This applies to either curved units over rectangular or two rectangular units together.

WINDOW COMBINATION — MULLION AND STRUCTURAL DATA

Combinations of Standard Sizes Widths of Openings

12" x 18" Glass	Total Number of Units	NO. OF LIGHTS PER UNIT Position of each number indicates position of unit in opening	Total Number of Lights	Total Number of Mullions	14" x 20" Glass
WIDTHS OF OPENINGS					WIDTHS OF OPENINGS
2' 1 5/8"	1	2	2	None	2' 5 3/8"
3' 2"	1	3	3	1	3' 8"
4' 2 3/4"	1	4	4	2	4' 10 3/8"
5' 2 3/4"	1	5	5	3	5' 0 3/8"
6' 3 3/8"	1	6	6	4	6' 3 3/8"
6' 6"	2	3, 3	6	1	7' 6"
8' 6 3/4"	2	4, 4	8	1	9' 10 3/4"
9' 10"	2	3, 3, 3	9	2	11' 4"
10' 7 1/2"	3	5, 5	10	1	12' 3 1/2"
10' 10 3/8"	3	3, 4, 3	10	2	12' 6 3/8"
11' 10 3/8"	3	3, 5, 3	11	2	13' 8 3/4"
11' 10 3/8"	3	4, 3, 4	11	2	13' 8 3/4"
12' 8 1/4"	2	6, 6	12	1	14' 8 1/4"
12' 11 1/8"	3	4, 4, 4	12	2	14' 11 1/8"
13' 11 1/8"	3	4, 5, 4	13	2	16' 1 1/8"
13' 11 1/8"	3	5, 3, 5	13	2	16' 1 1/8"
14' 11 1/8"	3	4, 6, 4	14	2	17' 3 1/8"
14' 11 7/8"	3	5, 4, 5	14	2	17' 3 7/8"
15' 2 3/4"	4	3, 4, 4, 3	15	3	17' 6 3/4"
16' 0 1/4"	3	5, 5, 5	15	2	18' 6 1/4"
16' 0 1/4"	3	6, 3, 6	15	2	18' 6 1/4"
17' 0 5/8"	3	5, 6, 5	16	2	19' 8 5/8"
17' 0 5/8"	3	6, 4, 6	16	2	19' 8 5/8"
17' 3 1/2"	4	4, 4, 4, 4	16	3	19' 11 1/2"
18' 1"	3	6, 5, 6	17	2	20' 11"
19' 1 3/8"	3	6, 6, 6	18	2	22' 1 3/8"
19' 4 1/4"	4	3, 6, 6, 3	18	3	22' 4 1/4"
19' 4 1/4"	4	4, 5, 5, 4	18	3	22' 4 1/4"
20' 7 1/2"	5	5, 3, 3, 3, 5	19	4	23' 9 1/2"
21' 5"	4	5, 5, 5, 5	20	3	24' 9"
21' 5"	4	4, 6, 6, 4	20	3	24' 9"
21' 7 1/8"	5	4, 4, 4, 4, 4	20	4	24' 11 7/8"
22' 8 1/4"	5	4, 4, 5, 4, 4	21	4	26' 2 1/4"
22' 8 1/4"	5	3, 5, 5, 5, 3	21	4	26' 2 1/4"
23' 5 3/4"	4	5, 6, 6, 5	22	3	27' 1 3/4"
23' 8 3/4"	5	5, 4, 4, 4, 5	22	4	27' 4 5/8"
23' 11 1/2"	6	3, 4, 4, 4, 4, 3	22	5	27' 7 1/2"
24' 9"	5	4, 5, 5, 5, 4	23	4	28' 7"
25' 6 1/2"	4	6, 6, 6, 6	24	3	29' 6 1/2"
25' 9 3/8"	5	3, 6, 6, 6, 3	24	4	29' 9 3/8"
26' 0 1/4"	6	4, 4, 4, 4, 4, 4	24	5	30' 0 1/4"
26' 9 3/4"	5	5, 5, 5, 5, 5	25	4	30' 11 3/4"
27' 10 1/8"	5	5, 5, 6, 5, 5	26	4	32' 2 1/8"
28' 1"	6	5, 4, 4, 4, 4, 5	26	5	32' 5"
28' 1"	6	3, 5, 5, 5, 5, 3	26	5	32' 5"
28' 10 1/2"	5	6, 5, 5, 5, 6	27	4	33' 4 1/2"
29' 10 7/8"	5	5, 6, 6, 6, 5	28	4	34' 6 7/8"
30' 1 3/4"	6	4, 5, 5, 5, 5, 4	28	5	34' 9 3/4"
30' 11 1/4"	5	6, 6, 5, 5, 6	29	4	35' 9 1/4"

Heights of Openings

12" x 18" Glass	14" x 20" Glass
Lights High	Lights High
1	1
2	2
3	3
4	4
5	5
6	6
7	7

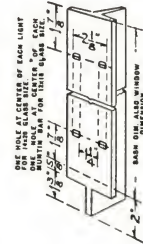
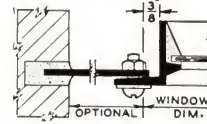
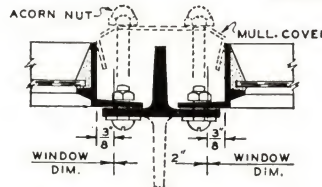
Table above shows overall opening dimensions of various standard units combined with mullions.

Note: In using above table, note that windows with projected ventilators are not standard in sizes more than 5 lights wide. Opening dimensions above showing 6 lights wide windows should not be used for projected types.

HORIZONTAL STRUCTURAL MULLION DATA

Number of Lights Wide	Mull Type	Angles	Plate or Channel	Est. Weight Per Ft.	Between Window Dimens.
12x18	14x20	No.	Size		
MULLIONS FOR SINGLE UNITS MORE THAN TWO UNITS HIGH					
3 to 6	3 to 5	A	1 1x1 1/2 1 2x1 1/2 x 1/2	None	3.0 lbs. 2"
FOR MULTIPLE UNITS					
6 to 9	5 to 8	B	2 1/2 x 2 1/2 x 1/2	None	6.3 lbs. 5"
10 to 13	9 to 11	C	2 1/2 x 2 1/2 x 1/2	6 x 1/4" Plt.	11.5 lbs. 5 1/4"
10 to 13	9 to 11	D	3 1/2 x 2 1/2 x 1/2	4" Channel	10.5 lbs. 5 1/4"
14 to 18	12 to 16	C	3 x 3 x 1/2	6 x 1/4" Plt.	17.3 lbs. 6 1/4"
14 to 18	12 to 16	D	4 x 3 x 1/2	6" Channel	15.5 lbs. 6 1/4"

Vertical Mullions



For units 5 lights high or less, stem may be turned in or out. For units over 5 lights high stem to be turned out.

Cover plate as dotted can be furnished when required.

Note: Double mullions furnished with windows 7 lights high.

Detail above shows use of jamb plates to adapt standard windows to opening larger than window dimensions.

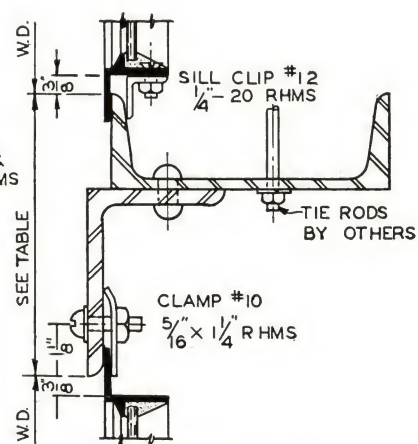
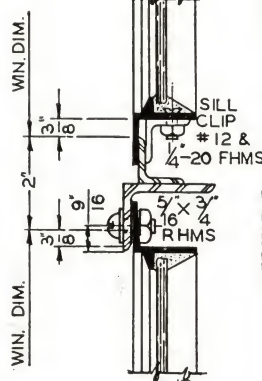
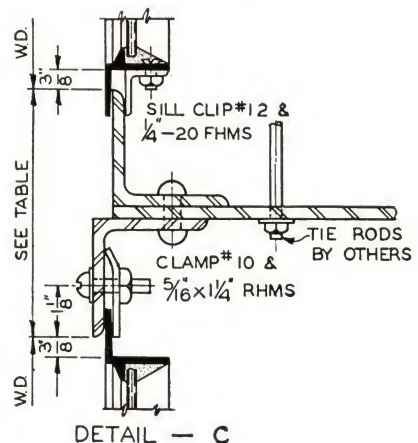
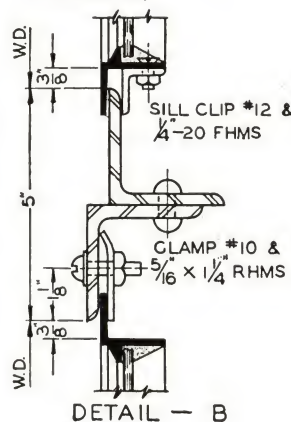
Standard mullion cutting and punching.

Standard "T" mullions shown at above right are cut off at top, level with sash dimension. At bottom, the flanges project 3/8" beyond sash dimension and the stem or web 2" beyond sash dimension. This is to allow suitable anchorage.

Horizontal Mullions

Where heights greater than seven lights are required in one opening, structural horizontal mullions are required to permit vertical combinations of sash units. Circle and camber head units are made to bolt directly to the sash underneath, for which horizontal mullions are not required unless the window is more than six lights wide. This also applies to single square units mounted one over the other not more than two units high. See detail page 22.

Tie Rods should support horizontal mullions in openings over 10 feet. Structural material is not customarily furnished with windows. These details however will serve as a guide in aiding designers to lay out such construction.



DETAIL — A

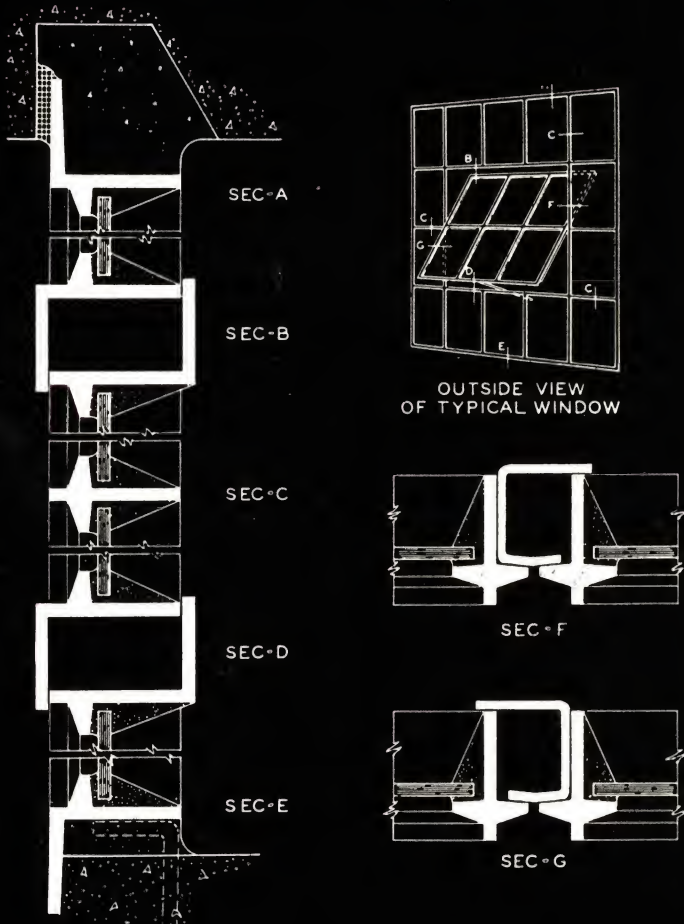
DETAIL — D

INDUSTRIAL AND COMMERCIAL WINDOWS

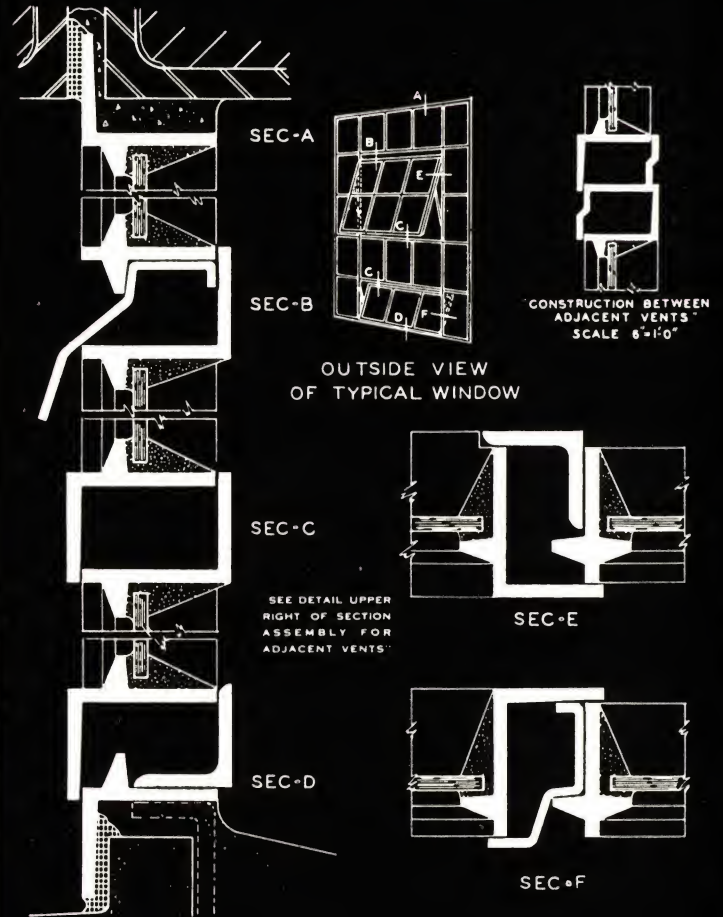
SECTION ASSEMBLY DETAILS

NOTE: Major sections are identical

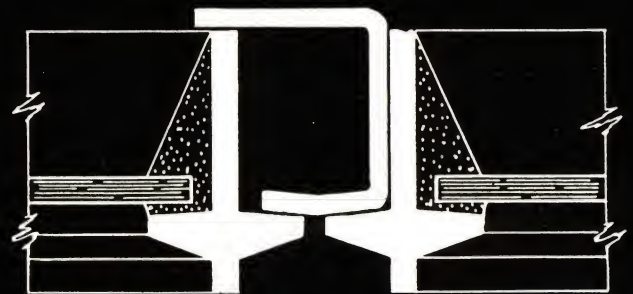
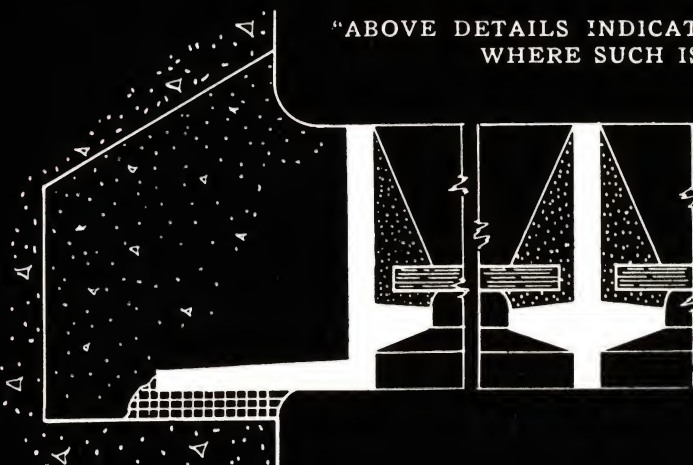
Pivoted Windows



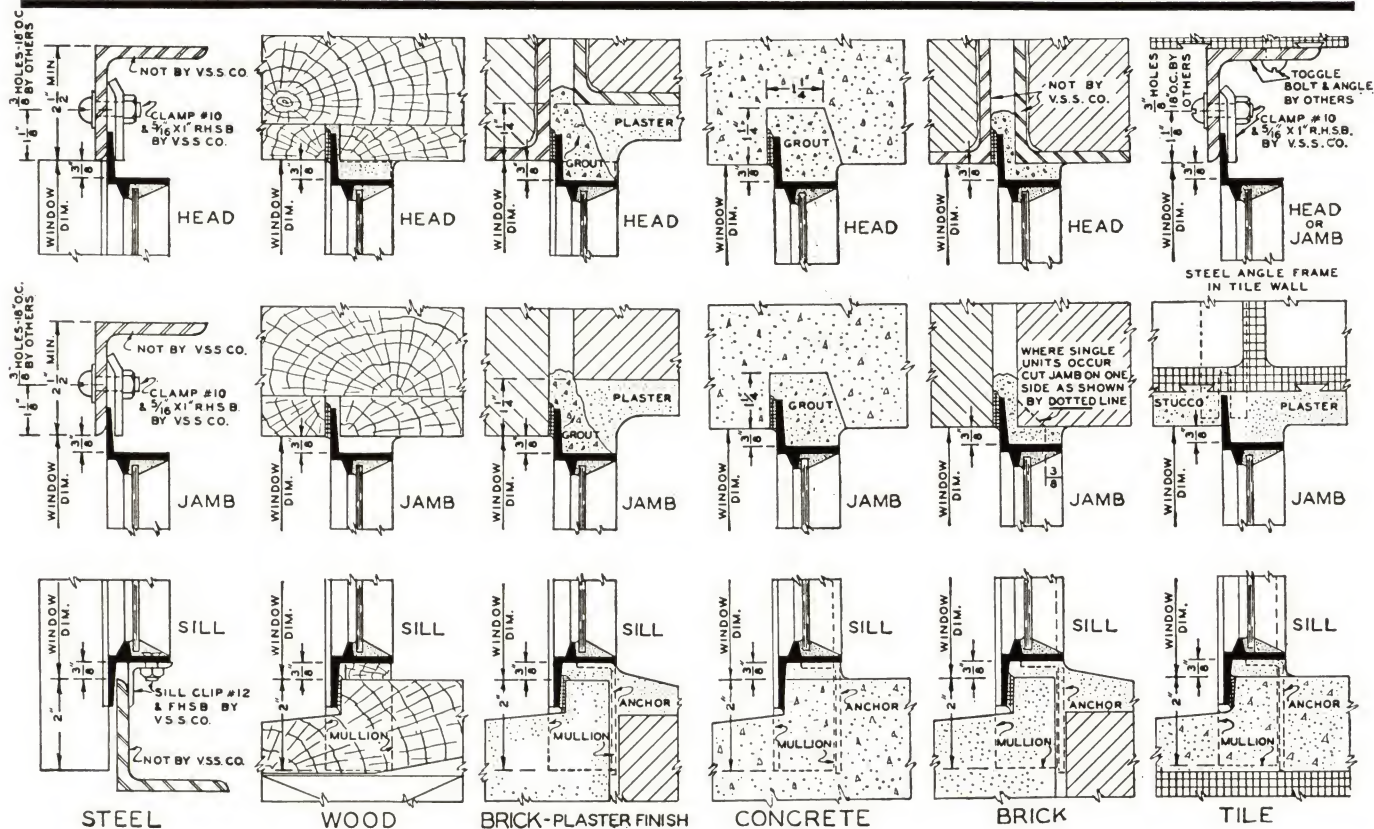
Projected Windows



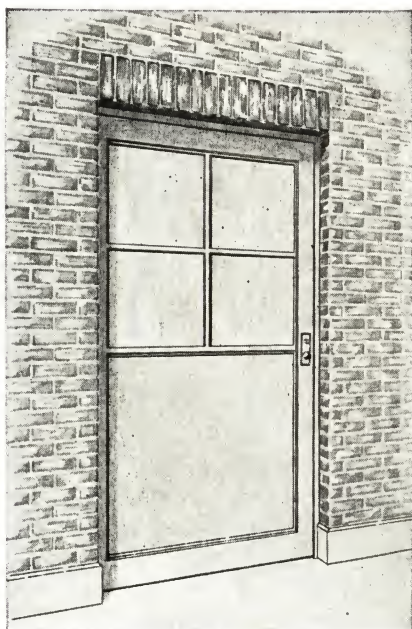
"ABOVE DETAILS INDICATE RECOMMENDED CAULKING POINTS WHERE SUCH IS REQUIRED OR SPECIFIED"



INSTALLATION DETAILS—INDUSTRIAL WINDOWS



INDUSTRIAL DOORS



Suitable for industrial buildings, service departments of commercial buildings and institutions.

Swing and slide types are available in a wide range of sizes to meet most conditions.

Stiles and rails are made of 14-gauge pressed steel tubing, all corners neatly fitted and solidly welded.

Standard pressed steel door frames are available for swing doors. The corners are heavily reinforced and prepared for hardware.

Doors can be fitted with cylinder lock or lever latch hardware as required.

Upper door panel may be steel sash open for glass or solid steel panels as desired.

STANDARD DOORS

OPENING SIZES					
SLIDE DOORS			SWING DOORS		
TYPE	SLIDE DOORS	SWING DOORS	TYPE	SWING DOORS	SWING DOORS
A	2'-3" X 6'-10 1/2"	2'-9" X 6'-10 1/2"	A	2'-6" X 7'-0"	3'-0" X 7'-0"
B	3'-3" X 7'-4 1/2"	3'-9" X 7'-10 1/2"	B	3'-6" X 7'-6"	4'-0" X 8'-0"
C	4'-9" X 9'-10 1/2"		C	5'-0" X 10'-0"	
D	4'-9" X 6'-10 1/2"	5'-9" X 6'-10 1/2"	D	5'-0" X 7'-0"	6'-0" X 7'-0"
E	6'-9" X 7'-4 1/2"	7'-9" X 7'-10 1/2"	E	7'-0" X 7'-6"	8'-0" X 8'-0"
F	9'-9" X 9'-10 1/2"		F	10'-0" X 10'-0"	

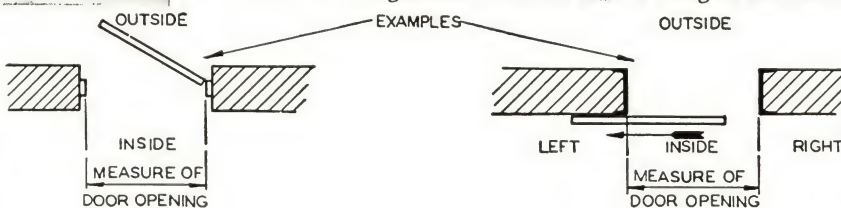
TYPES



NOTE: Drawings or orders should include swing or direction of slide.

SWING DOOR DIMENSIONS

Opening width dimensions are taken back to back of steel door frame. Opening height dimensions are taken from top of threshold to underside of steel frame at head.



SLIDE DOOR DIMENSIONS

Opening width dimensions are taken from back to back of structural channel frame. Opening height dimensions are taken from top of threshold to underside of structural head.

VENTO PROTECTION WINDOWS



Inside View of Protection Window with Ventilator Open

This is a strong heavily constructed, completely welded type of window especially designed for maximum protection requirements or for psychopathic, reformatory or other institutional semi-detention purposes.

This is a considerably heavier window than the Security type illustrated on page 28 in that the size of the lights in the Protection type are 6" x 9", just half the size of those in the Security window. This smaller glass opening and consequent greater window strength adapts these windows to a wide range of use within the detention window field.

Protection Windows are made to order and can be built in sizes, glass areas, muntin and ventilator arrangements to suit conditions.

Standard sizes and customary ventilator areas are those as indicated on the opposite page, the ventilator areas being those as shown within the heavy outlines. The size, number and location of same, however, are optional and may be specified according to the requirements.

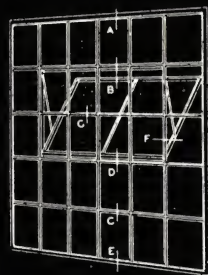
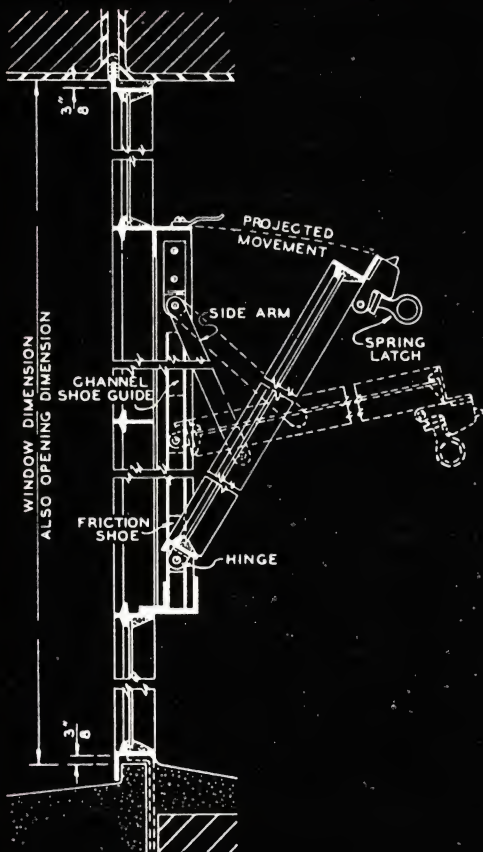
Muntin bar spacings shown are those in the main frame. Muntins in the ventilators are supplied in accordance with glass area limits per light of 540 square inches. Construction drawings are supplied with each job indicating muntin arrangements in detail.

Ventilators are made from 3 lights wide x 2 lights high up to 8 lights wide x 4 lights high.

The sizes shown on the opposite page are masonry openings based on standard 6" x 9" glass sizes. These opening dimensions are taken to the points as shown on page 25. Anchorage is provided over and above opening dimensions.

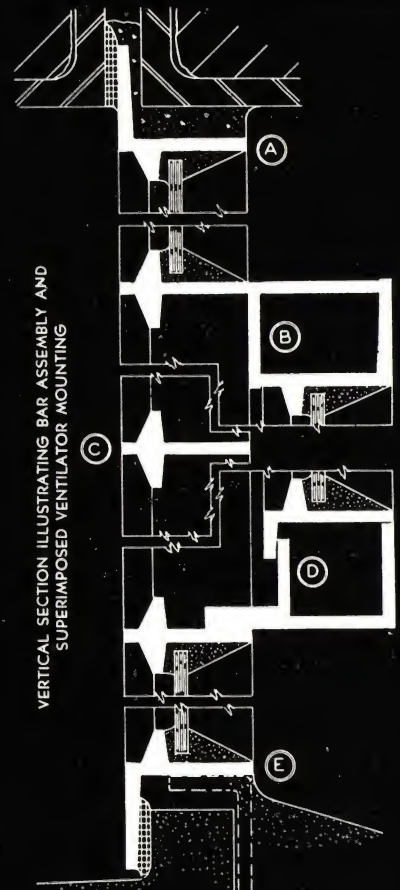
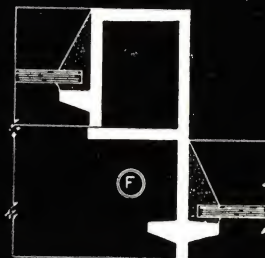
Strong rust-proof spring latch hardware is supplied with all these windows, which are shipped heavily painted.

Flat outside screens can be supplied.



OUTSIDE VIEW OF TYPICAL WINDOW

INSIDE PUTTY GLAZING IS STANDARD



VERTICAL SECTION ILLUSTRATING BAR ASSEMBLY AND SUPERIMPOSED VENTILATOR MOUNTING

PROTECTION WINDOWS

STANDARD TYPES AND SIZES

	1'-8"	2'-2 $\frac{1}{2}$ "	2'-8 $\frac{1}{4}$ "	3'-3 $\frac{1}{2}$ "	3'-9 $\frac{1}{2}$ "	4'-3 $\frac{3}{8}$ "	4'-10 $\frac{1}{4}$ "	5'-4 $\frac{3}{8}$ "	5'-11"	6'-5 $\frac{3}{8}$ "
FIXED										
VENTILATED	32 32-1-8	42 42-1-8	52 52-1-10	62 62-1-8	72 72-1-10	82 82-1-8	92 92-1-10	10-2 10-2-1-12	11-2 11-2-1-14	12-2 12-2-1-16
FIXED										
VENTILATED	33 33-1-6	43 43-1-8	53 53-1-10	63 63-1-8	73 73-1-10	83 83-1-8	93 93-1-10	10-3 10-3-1-12	11-3 11-3-1-14	12-3 12-3-1-16
FIXED										
VENTILATED	34 34-1-6	44 44-1-8	54 54-1-10	64 64-1-8	74 74-1-10	84 84-1-8	94 94-1-10	10-4 10-4-1-12	11-4 11-4-1-14	12-4 12-4-1-16
FIXED										
VENTILATED	35 35-1-6	45 45-1-8	55 55-1-10	65 65-1-8	75 75-1-10	85 85-1-8	95 95-1-10	10-5 10-5-1-12	11-5 11-5-1-14	12-5 12-5-1-16
FIXED										
VENTILATED	36 36-1-9	46 46-1-12	56 56-1-15	66 66-1-12	76 76-1-15	86 86-1-12	96 96-1-15	10-6 10-6-1-18	11-6 11-6-1-21	12-6 12-6-1-24
FIXED										
VENTILATED	37 37-1-9	47 47-1-12	57 57-1-15	67 67-1-12	77 77-1-15	87 87-1-12	97 97-1-15	10-7 10-7-1-18	11-7 11-7-1-21	12-7 12-7-1-24
FIXED										
VENTILATED	38 38-1-12	48 48-1-16	58 58-1-20	68 68-1-16	78 78-1-20	88 88-1-16	98 98-1-20	10-8 10-8-1-24	11-8 11-8-1-28	12-8 12-8-1-32
FIXED										
VENTILATED	39 39-2-9	49 49-2-12	59 59-2-15	69 69-2-12	79 79-2-15	89 89-2-12	99 99-2-15	10-9 10-9-2-18	11-9 11-9-2-21	12-9 12-9-2-24
FIXED										
VENTILATED	3-10 3-10-2-9	4-10 4-10-2-12	5-10 5-10-2-15	6-10 6-10-2-12	7-10 7-10-2-15	8-10 8-10-2-12	9-10 9-10-2-15	10-10 10-10-2-18	11-10 11-10-2-21	12-10 12-10-2-24
FIXED										
VENTILATED	3-11 3-11-2-12	4-11 4-11-2-16	5-11 5-11-2-20	6-11 6-11-2-16	7-11 7-11-2-20	8-11 8-11-2-16	9-11 9-11-2-20	10-11 10-11-2-24	11-11 11-11-2-28	12-11 12-11-2-32
FIXED										
VENTILATED	3-12 3-12-2-12	4-12 4-12-2-16	5-12 5-12-2-20	6-12 6-12-2-16	7-12 7-12-2-20	8-12 8-12-2-16	9-12 9-12-2-20	10-12 10-12-2-24	11-12 11-12-2-28	12-12 12-12-2-32

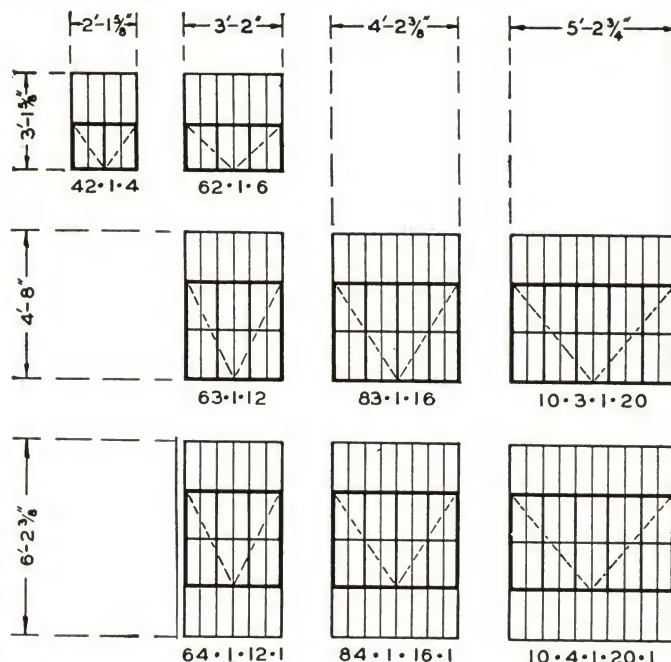
VENTO SECURITY WINDOWS—STANDARD SIZES



Type
62-1-6

The Vento Security window is a specially designed stock type to serve the same purpose for which barred windows have heretofore been used. The heavy, fully welded construction will provide adequate protection under ordinary circumstances for all commercial requirements.

The construction in general is the same as for Protection windows illustrated on page 26 except that the lights in the Security windows are 6" x 18" approximately corresponding to the spacing of bars in the type of windows ordinarily used for this purpose. Ventilator is of regular size light superimposed on inside of main frame, swinging in at the top and operating through concealed retaining arms that hold the ventilator in any open position.



This window usefully serves all protection requirements for installation in rear or alley elevations of stores and other similar commercial construction.

Shipped complete, heavily painted, with rust-proof spring latch hardware, erection fittings, wire glazing clips and main frames prepared to receive flat outside screens.

AREAWAY AND UTILITY WINDOWS

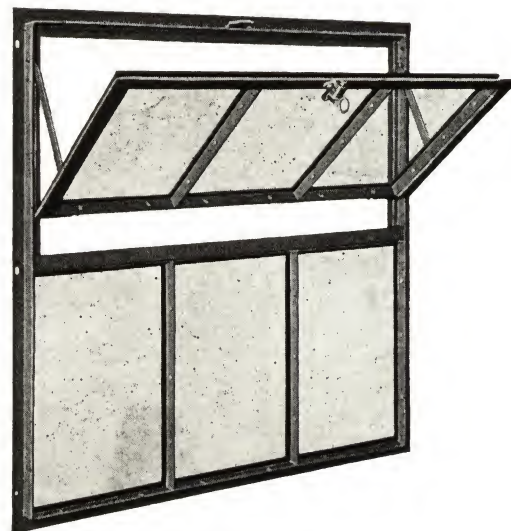


Vento Areaway Window

Made in one size only, for masonry openings $32\frac{1}{8} \times 24\frac{1}{8}$ in.

The areaway window is of special size and arrangement. It is specially designed for basement areaway openings. The ventilator extends nearly to the bottom leaving a fixed panel to exclude dirt, leaves and snow.

Same construction as our standard commercial windows. Double contact weathering. Inward projected movement with bronze shoes and adjustable friction. Spring latch pole ring, solid bronze hardware. These are dependable weather-tight windows of superior construction. Both types are drilled and tapped for standard flat outside screens.



Vento Utility Window

The utility window in addition to its use for home garages, has a wide application for stores, laundries, creameries, service stations and other commercial structures.

Made in two sizes:

6 light—10 x 16 in.—opening $32\frac{1}{4} \times 35\frac{7}{8}$ in.

6 light—12 x 20 in.—opening $40\frac{1}{4} \times 43\frac{7}{8}$ in.

Both sizes fit concrete blocks.

VENTO PREMIER BASEMENT WINDOWS •

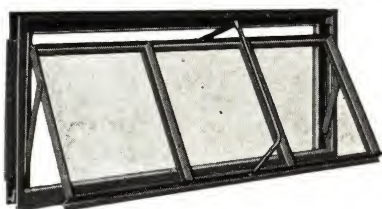


First Open Position Giving Overhead Ventilation With Air Currents Deflected Up and Over Without Direct Draft

- HEAVY DUTY CHANNEL FRAME
- ELECTRICALLY WELDED THROUGHOUT
- VERSILATOR OPERATION (Patented)
- PUTTYLESS GLAZING
- DOUBLE CONTACT WEATHERING
- WATERTIGHT : : : WEATHERPROOF
- PATENTED LOCKING BAR OPERATES WINDOW FROM BOTTOM

Versilator Operation.

An exclusive design feature of Vento PREMIER windows. This simple and reliable device gives either overhead or direct ventilation in any selected degree, with positive automatic locking at each stage. Sash is instantly removable from frame in any position.



Intermediate Top Hung Position. Both Top and Bottom Ventilation With Downward Deflection

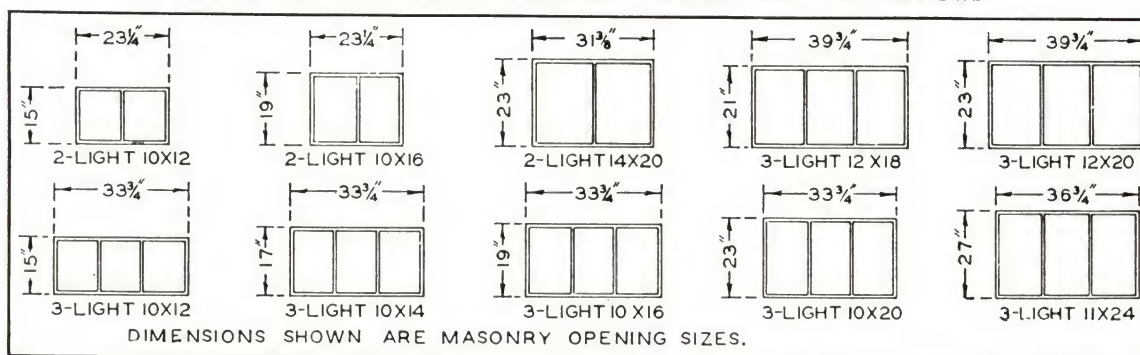


Merely Raising the Sash From the Intermediate Position Locks the Window in Fully Open Position. No Ceiling Hook Required



Sash Lifts Off Sill and Hangs Down Inside the Wall Giving Full Opening for Use as a Coal Window or Other Purposes

WINDOW SIZES AND MASONRY OPENINGS—"PREMIER" BASEMENT WINDOWS



NOTE—2-Light 10 x 16, 3-Light 10 x 14 and 3-Light 11 x 14 are non-stock sizes.

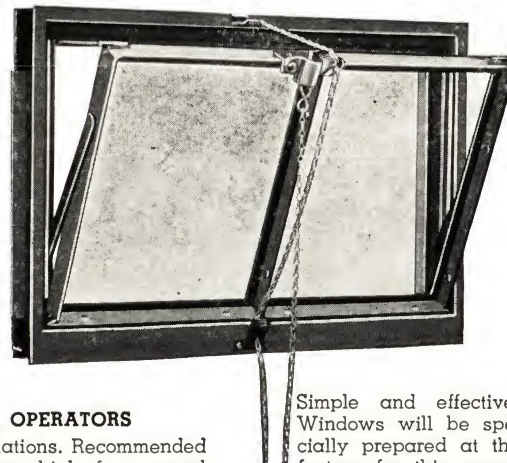


BARRED WINDOWS

For efficient protection 1/2-in. bars are welded into frame. Recommended for cellars and rear or alley elevations of commercial buildings. See also Security Windows, page 28

SCREENS, SCREEN GUARDS AND STORM SASH STOCKED FOR ALL WINDOW SIZES

Basement windows can be mullioned together for installation under show windows, above shelving or over laundry tubs.



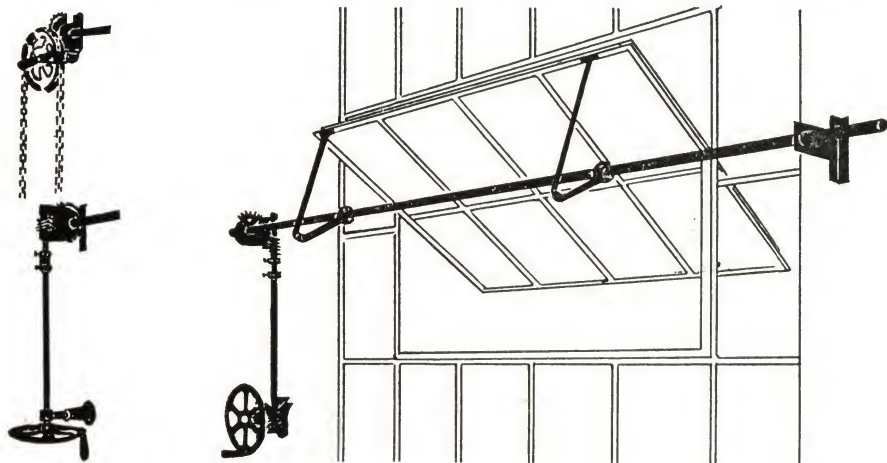
CHAIN OPERATORS

For high installations. Recommended for locations too high for manual operation

Simple and effective. Windows will be specially prepared at the factory for this operation

VENTO MECHANICAL OPERATORS

FOR GROUP CONTROL OF WINDOWS



Powers Should Not Be Placed More Than Sixty Feet From Ends of Run

Typical installation above is of the torsion type operator with marginal illustrations of other types of powers, i. e.,—chain control, horizontal wheel and bevel gear.

Type of power should be specified. Where conditions prevent control points being under a window, chains can be run over idlers or rod can be run through universal joints to the walls.

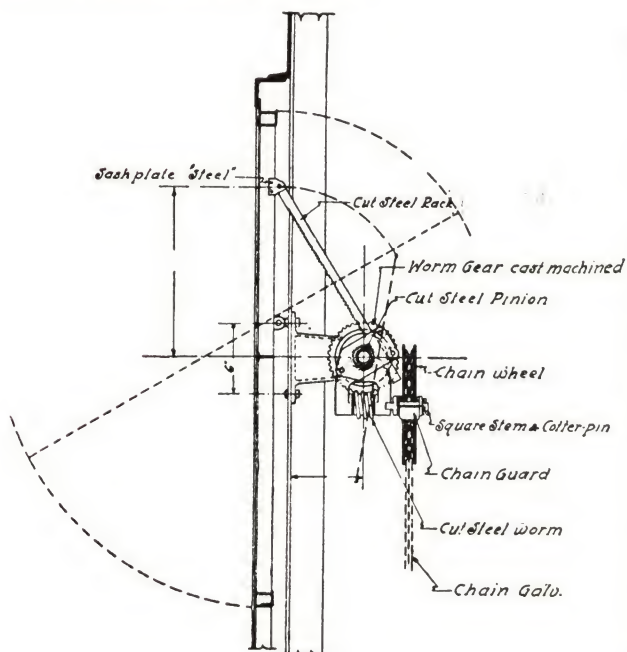
NOTE—Mechanical operators are largely designed and supplied to job requirements. Our engineering department will submit designs to suit.

A folder of engineering design plates fully detailing all types of operators is available on request.

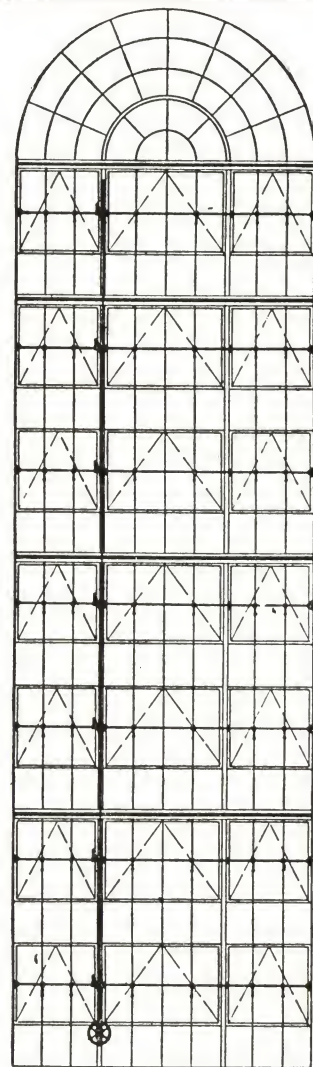
For Tension Type Operator see page 31.

• RACK AND PINION OPERATORS •

These are for heavy duty service giving easy operation and positive action. Chain, rod or electrical control—see the table below.



Where structural interference prohibit the use of straight races, convex races are supplied.



Screw Type Operator for Large Sash Groups in Auditoriums, Power Houses, etc.

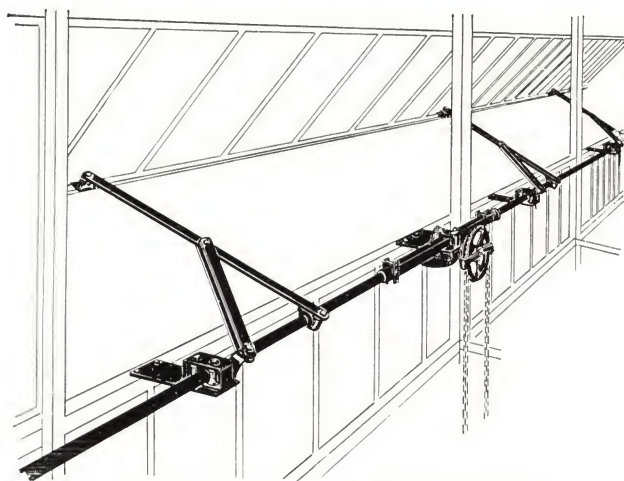
CAPACITY TABLE TORSION OPERATORS, WORM AND GEAR

Type of Vents	Size Lts. Wide	Vents Lts. High	No. Vents	Length of Run	Power to End of Run	Control
Hor. Pivoted...	2 x 2		12	80'	40'	Chain and Wheel Rod and Hor. Wheel Rod and Vert. Wheel
Hor. Pivoted...	3 x 2		12	80'	40'	
Hor. Pivoted...	4 x 2		12	80'	40'	
Projected	2 x 2		12	80'	40'	
Projected	3 x 2		12	80'	40'	
Top Pivoted...	2 x 2		8	60'	30'	
Bot. Pivoted...	3 x 2		8	60'	30'	
Top Hinged...	4 x 2		8	60'	30'	
Bot. Hinged...						

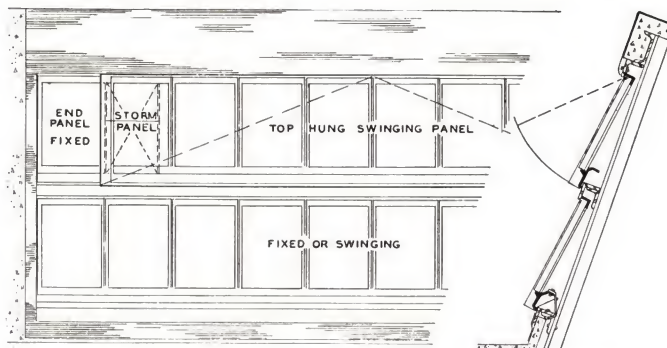
RACK AND PINION

Hor. Pivoted...	2 x 2	24	160'	80'	Chain and Wheel Rod and Hor. Wheel Rod and Vert. Wheel
Hor. Pivoted...	3 x 2	24	160'	80'	
Hor. Pivoted...	4 x 2	24	160'	80'	
Projected	2 x 2	20	100'	50'	
Projected	3 x 2	20	100'	50'	
Top Pivoted...	2 x 2	16	80'	40'	
Bot. Pivoted...	3 x 2	16	80'	40'	
Top Hinged...	4 x 2	16	80'	40'	
Bot. Hinged...					

VENTO TOP HUNG CONTINUOUS WINDOWS FOR HEAVY INDUSTRIAL CONSTRUCTION

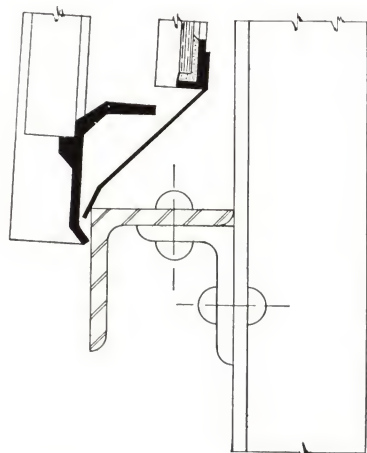


Top Hung Window with Tension Operator



Nominal spacing of muntins 2'-0" sash panels made in lengths of 2 ft multiples up to maximum length of 20 ft.

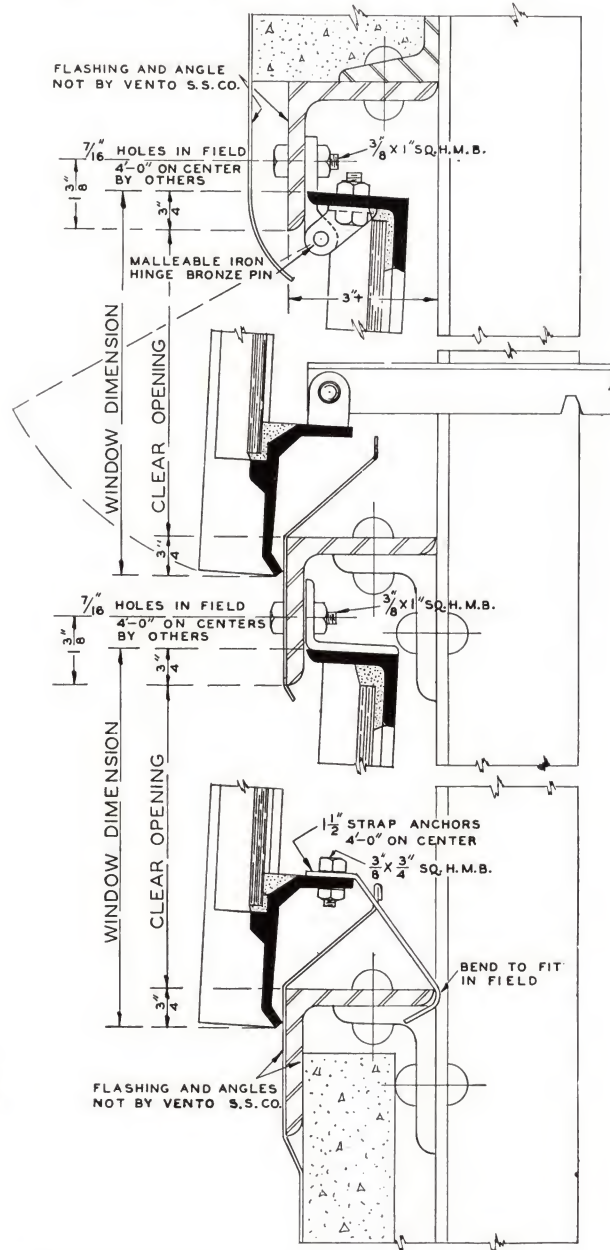
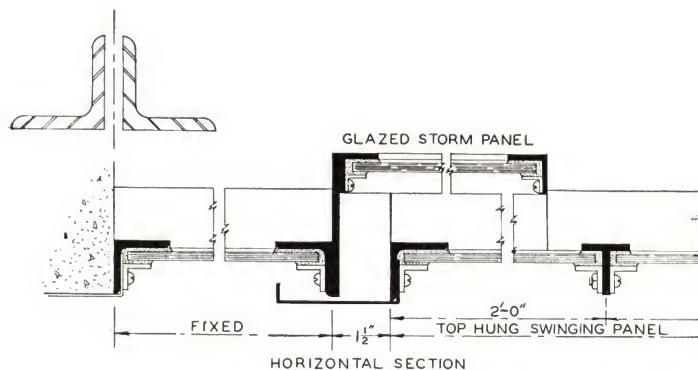
Standard Panel Heights Are 3, 4, 5 and 6 Ft.



SECTION AT SILL OF STORM PANEL

General structural details are as shown herewith. This type of window, however, is detailed according to the requirements of the individual job and the specific structural layout.

Storm panels are especially recommended with sloping continuous windows, allowing the continuous windows to be opened during heavy rainfall without the danger of damage to the interior of the building.





Digitized by ASSOCIATION FOR PRESERVATION TECHNOLOGY, www.apti.org for the
BUILDING TECHNOLOGY HERITAGE LIBRARY
<https://archive.org/details/buildingtechnologyheritagelibrary>